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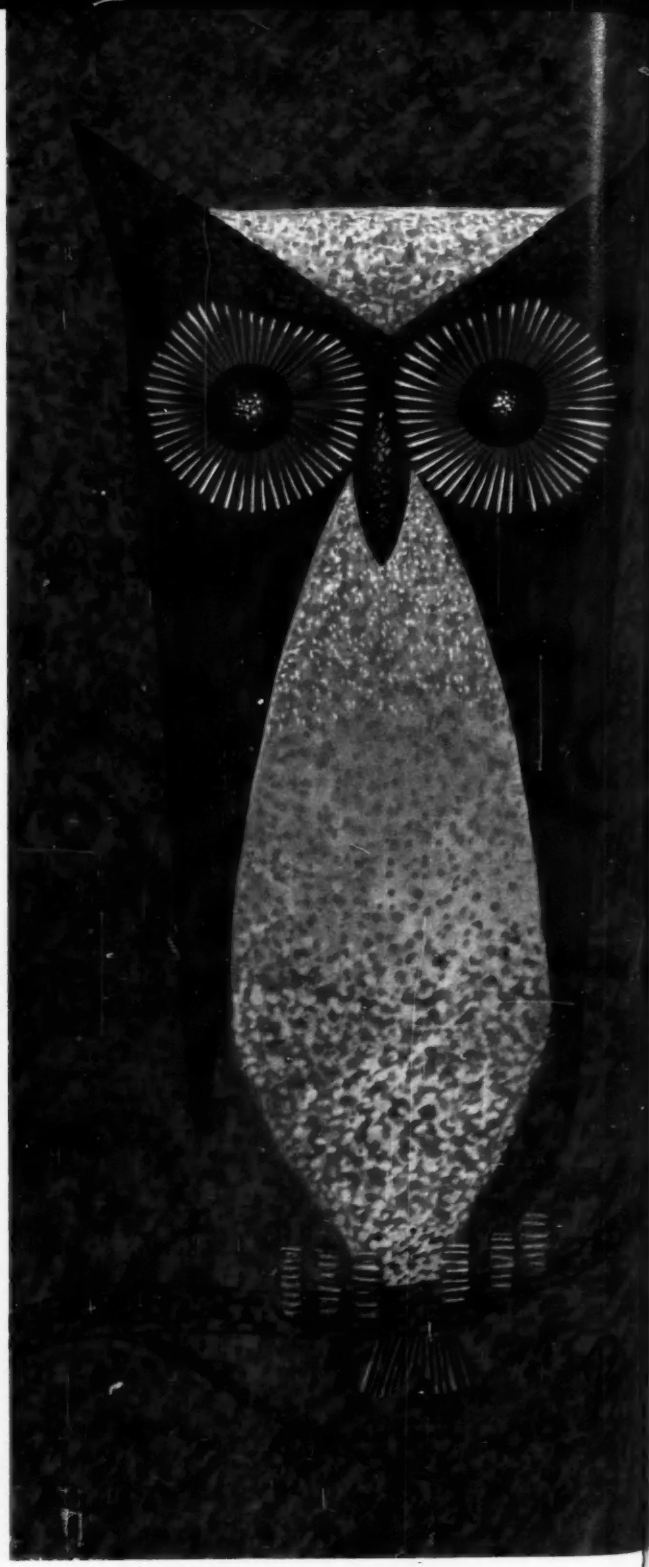

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AMERICAN

DYESTUFF REPORTER

Volume 49 July 25, 1960 No. 15

STUDIES OF WRINKLE RESISTANCE FINISHES FOR COTTON TEXTILES II—EFFECT OF STORAGE ON PROPERTIES OF "WASH-AND-WEAR" COTTONS

J DAVID REID, ROBERT M REINHARDT, RUSSELL M H KULLMAN and RICHARD L ARCENEAUX

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The properties of some "wash-and-wear" cotton textiles are adversely affected by prolonged storage prior to reaching the consumer. In the present study, the effects of storage of fabrics treated with five types of N-methylol finishing agents were investigated. Chlorine resistance, breaking and tearing strength, and wrinkle resistance were determined.

The process wash after curing was found to be a critical factor affecting the durability of desirable properties of the finished fabric to storage. Particularly vulnerable to degradation by storage was the chlorine resistance of fabric treated with dimethylol ethyleneurea and the wrinkle resistance of fabric treated with a pyrimidinone derivative when the fabric was not afterwashed. Cotton treated with a triazone or melamine derivative also showed increased chlorine damage when not washed before storage.

INTRODUCTION

IT is generally conceded that wrinkle-resistant cotton goods should be given an afterwash immediately following the curing process. In the last two years increasing yardage of wrinkle-resistant cotton has appeared on the market in the unwashed condition. The full consequences were not immediately apparent. It is the purpose of this paper to discuss the results of this on cotton finished with several commercial methylol nitrogenous finishing agents.

It is obvious that practical information on the implications inherent in not washing such treated goods is of great importance to the finishing industry and to cotton. On the one hand, savings in cost without serious effect on the usefulness of the goods would be valuable to finisher and consumer alike. On the other hand, serious detriment to the finish can result only in harm to the future of cotton in the competition with synthetic fibers for the "wash-and-use" market. Discussion of the effects of not afterwashing have been given by a number of investigators (*1,2,3*) but most of this work has been on finishes using dimethlyol ethyleneurea (DMEU). Whether these warnings apply to other fiinishing agents has not been established. In the present study, the results obtained with other agents are compared with those obtained with DMEU.

The immediately obvious result of not washing wrinkle-resistant goods was to cause serious problems in retail stores selling yard goods or garments made from the fabric because of odor problems due to fumes (*4*). In the presence of acidic catalysts, such as zinc nitrate, magnesium chloride or amine hydrochloride, the crosslinking of cellulose with methylolated nitrogenous finishing agents occurs rapidly at high temperatures with elimination of water and much more slowly at room temperature. It is less generally realized that this reaction is also reversible at the usual storage temperatures encountered by the fabrics particularly in the presence of the catalyst. The reverse reaction causes the release of fumes of formaldehyde as discussed in a previous study (*5*). Such fumes are a nuisance which might be tolerated by the consumer, if it were not for the hidden damage which occurs. With DMEU for example, a good cure theoretically should produce crosslinks with no sites available for the formation of chloramides during bleaching. It has been shown that this finish has good resistance to chlorine damage under certain conditions of cure and aftertreatment (*6,7*). When the crosslinking reaction is reversed, sites for the attachment of chlorine are furnished and the fabric becomes susceptable to chlorine damage.

Bacon and coworkers (*1*) state, referring to DMEU, "A neutralizing wash after curing is essential for the best resistance to chlorine damage, especially after laundering". Storage times were not given. Mosher (*2*) points out that DMEU finishes become susceptible to damage during laundering and bleaching due to storage of finished fabrics under improper conditions of pH, steaming, and possibly even sunlight. In his work, samples of cloth were finished with DMEU and part washed immediately and part reserved unwashed. Both types were stored for one month and then laundered and submitted to the AATCC 69-1952 "scorch test". Loss of strength averaged 51% for the fabric that was not washed and only 3% for the afterwashed fabric. The effect of pH was confirmed by storage of samples of treated cloth which had been impregnated before storage with solutions the pH of which varied from 5.1 to 7.8.

[1]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, U S Department of Agriculture.

Less than a month after the presentation of the paper by Mosher, English work was presented by A R Smith on the same subject (*3*). He also used DMEU and investigated a considerable range of catalysts. Only zinc nitrate and magnesium chloride, of those identified, gave satisfactory results under optimum conditions. A good cure (160°C) was necessary. Smith found, with storage times up to eight weeks, that cloth which was given a wash immediately after curing was generally satisfactory, but if it was not given an afterwash, the chlorine resistance dropped off. Furthermore, if the unwashed, stored samples were given an alkaline laundering just before testing, the chlorine damage was even greater.

Work on degradation of finishes during storage had begun at this Laboratory previous to the presentations by Mosher and Smith and advantage was taken of their results to amplify this work. Accelerated storage tests also were investigated but apparently anomalous results were obtained which necessitated a more detailed study. A full report of this will be given in a separate publication.

MATERIALS AND METHODS

Fabric used was a desized, caustic-boiled and bleached 80 × 80 white cotton print cloth, 3.2 oz/sq yd. Treatments were carried out as follows: The fabric was padded with a solution of the finishing agent containing catalyst to a wet pickup of about 75%. The fabric, mounted on pin frames, was dried at 60°C for seven minutes and cured for four minutes at 160°C in an electric oven with circulating air. Following the curing step, some samples, as noted in the text, were given a process wash at 100°F, with a solution of approximately 0.03% of a nonionic detergent of the alkylarylpolyether alcohol type, in an automatic home washer using the modern fabrics cycle. After the wash, the samples were tumbled dry and air-equilibrated. Some samples, as noted in the text, were not process washed after curing.

The finishing agents used were:

UREA-FORMALDEHYDE (UF)———A precondensate of one mole of urea and 1.6 moles of formaldehyde was prepared and stored for 24 hours in the laboratory and then applied to fabric from a 14% pad bath.

DIMETHYLOL ETHYLENEUREA (DMEU)———This material, commercially available as a 50% solution, was applied to fabric from a 9% pad bath.

DIMETHYLOL ETHYLTRIAZONE (DMET)———The preparation used was obtained from a commercial source as a 45% solution. It was reportedly a "pure" triazone in that it was not blended with urea-formaldehyde as some commercial products are. It was applied to fabric from a 9% pad bath which also contained emulsified polyethylene as an additive.

DIMETHYLOL HEXAHYDROPYRIMIDINONE (DMP)———This relatively new agent, available in experimental quantities from a commercial source, was obtained as a 50% solution and was applied from a 7.5% pad bath.

METHYLATED METHYLOLMELAMINE (MMF)———This material, a methylated trimethylolmelamine precondensate, was obtained commercially as an 80% syrup. It was applied from a 9% pad bath.

The catalysts employed were zinc nitrate, used at 0.5% bath concentration, magnesium chloride used as 16% of finishing agent solids concentration, and an alkanolamine hydrochloride used as 3.5% of finishing agent solids.

Nitrogen content of samples was determined by the Kjeldahl method.

Physical testing was performed by standard methods at 70°F and 65% relative humidity. Breaking strength was determined on strips raveled to 80 threads (*8a*), tearing strength by the Elmendorf method (*8b*), and crease recovery angle on the Monsanto Tester (*8c*).

The AATCC scorch test method was used to determine damage caused by retained chlorine (*9*). Results are reported as percent of the original strength retained after scorching. Available chlorine retained by the fabric was determined by an iodometric titration as has been reported previously (*10*).

Storage of fabric samples was carried out at 70°F and 65% relative humidity.

BACKGROUND INFORMATION

In consideration of the experimental data presented below, a brief review of the chemistry of the finishing reaction is in order. The agents used were methylol amides and a methylol amine. These compounds react with cellulose in the presence of an acidic catalyst as follows:

$$\text{Cell-OH} + \text{HOCH}_2\text{N}\!\!\diagup\!\!\diagdown \rightleftharpoons \text{Cell-OCH}_2\text{-N}\!\!\diagup\!\!\diagdown + \text{H}_2\text{O}$$

The finishing agents used are multifunctional and react to crosslink adjacent cellulose chains thus conferring the desired wrinkle resistance and "wash-and-wear" properties to the cotton fabric.

It should be especially noted that the reaction is reversible and is catalyzed in both directions by acidic materials. In the finishing treatment the reaction proceeds in the forward direction with the elimination of water at the high temperature of curing. The reversibility of the reaction is well known and for many years, when desired, finishes have been stripped from fabric by treatment with aqueous acid solutions (*11*).

Cotton fabric which is stored always has water present, of course, from the moisture in the air. Many commerical warehouses and other storage facilities are quite warm during the summer and conditions become suitable for reversal of the reaction if a trace of acid is present in the fabric. It is, therefore, desirable that fabrics be given a process wash following curing, preferably slightly on the alkaline side, to remove all traces of residual catalyst. Otherwise, the catalyst may slowly reverse the effects which have been achieved in processing.

The results of acidic hydrolysis on storage may have several highly detrimental effects on wrinkle-resistant fabrics. Crosslinkages which produce the "wash-and-wear" effects are broken and there is a loss of this valuable property. Also, the hydrolysis can go a step farther and cause loss of the methylol group from the nitrogen atom in the following manner:

$$\left[\text{HOCH}_2\text{-N}\!\!\diagup\!\!\diagdown\right] \rightarrow \text{HCHO} + \text{HN}\!\!\diagup\!\!\diagdown$$

The results of this reaction are noxious fumes due to the liberation of formaldehyde, leaving a nitrogen atom with an available hydrogen. With hypochlorite bleaching the following reaction may take place to yield a chloramine or chloramide:

$$\text{HN}\!\!\diagup\!\!\diagdown + \text{NaOCl} \rightarrow \text{ClN}\!\!\diagup\!\!\diagdown + \text{NaOH}$$

Chlorine retention is one of the prime causes of failure of many "wash-and-wear"cottons. Care should be taken to guard against acidic hydrolysis on storage. The process wash is one of the simplest forms of re-

ducing this type of damage.

It is one of the purposes of this paper to give quantitative data on changes in resistance to chlorine damage which may occur when wrinkle-resistant cottons are marketed without a process wash.

EXPERIMENTAL AND DISCUSSION

Samples of cotton print cloth were treated with the five finishing agents using three different catalysts with each agent. Each treated fabric was then divided into three portions giving a total of 45 treated samples. One portion was process washed immediately after curing and stored for 35 days before testing; a second portion was stored for 35 days, then process washed and tested; the third portion was stored for 35 days and tested without washing. The data obtained from testing of the samples are shown in Table I.

Superficial examination of these data would lead to the belief that, in general, fabric samples which have never been washed have the best wrinkle-resistance properties. Crease-recovery angles are about the same or higher, nitrogen contents greater, and tearing strengths and breaking strengths are comparable. However, comparison with samples washed after storage show that this improved wrinkle resistance is temporary and would be lost at the first laundering. These data show that the water-soluble nitrogen-containing degradation products of the finish are capable of contributing to the wrinkle resistance of the fabric.

From the viewpoint of the consumer and the manufacturer, this is of great practical importance. For example, a shopper may buy a garment with apparently good wrinkle resistance which, however, is lost after the first laundering. The garment may also be more susceptible to chlorine damage. Garments such as these will probably cause loss of confidence in "wash-and-wear" cottons by the consumer and consequent loss of market for the product.

In those samples treated with UF, as shown in Table I, the differences in chlorine resistance are not of much importance because UF has such a large number of amido hydrogens that it has little initial chlorine resistance. Those samples treated with DMEU and not washed show a serious loss of chlorine resistance. Whereas the three samples washed before storage lost less than 6%, the six unwashed samples lost 35-64% of their strength in the scorch test. It is

TABLE I

Properties after 35 days storage of cotton print cloth treated with various finishing agent-catalyst systems[1]

Treatment		Finished, process washed, stored, and tested					Finished, stored, process washed, and tested					Finished, stored and tested				
Finishing Agent	Catalyst	N %	Cr rec angle (W+F) deg	Break strength (W) lb	Tearing strength (W+F) g	Cl damage % orig str retained	N %	Cr rec angle (W+F) deg	Break strength (W) lb	Tearing strength (W+F) g	Cl damage % orig str retained	N %	Cr rec angle (W+F) deg	Break strength (W) lb	Tearing strength (W+F) g	Cl damage % orig str retained
None (untreated fabric)[2]		—	189	52.5	2087	96.2	—	189	52.5	2087	96.2	—	189	52.5	2087	96.2
Urea-formaldehyde (1:1.6)	$Zn(NO_3)_2$	3.03	288	33.2	820	65.7	2.96	286	35.7	854	52.2	3.06	281	35.7	774	51.7
"	$MgCl_2$	2.66	273	34.7	927	44.8	2.34	273	31.2	914	40.3	2.93	267	35.5	800	36.7
"	$RNH_2 \cdot HCl$	3.22	291	35.2	867	52.1	3.10	281	36.8	920	54.0	3.20	288	39.0	913	51.6
Dimethylol ethyleneurea	$Zn(NO_3)_2$	1.43	286	31.2	880	100.0	1.24	277	31.8	1027	46.2	1.48	301	31.9	973	36.5
"	$MgCl_2$	1.33	284	29.3	900	97.6	1.37	273	30.5	913	65.2	1.41	297	32.3	926	51.8
"	$RNH_2 \cdot HCl$	1.39	279	33.8	887	94.4	1.35	279	33.4	1020	62.0	1.44	293	33.5	1000	60.2
Dimethylol ethyltriazone[3]	$Zn(NO_3)_2$	1.14	287	31.5	1167	91.6	1.00	288	33.6	1173	79.5	1.20	303	29.0	1134	90.3
"	$MgCl_2$	1.06	268	33.4	1200	84.7	1.03	257	31.1	1193	94.3	1.18	295	30.6	1054	84.6
"	$RNH_2 \cdot HCl$	1.14	271	36.9	1314	77.0	1.10	267	35.7	1300	77.2	1.21	275	33.6	1193	78.6
Dimethylol pyrimidinone	$Zn(NO_3)_2$	1.02	266	38.0	1080	96.4	0.77	225	40.8	1213	96.5	1.07	270	41.9	1174	85.7
"	$MgCl_2$	0.93	262	36.6	1000	93.6	0.78	238	38.1	1080	88.9	1.04	272	36.4	1067	87.1
"	$RNH_2 \cdot HCl$	0.95	252	42.6	1007	84.6	0.88	236	42.3	1173	89.3	1.01	265	42.7	1180	82.9
Methylated methylolmelamine	$Zn(NO_3)_2$	2.47	271	33.3	1180	95.3	2.36	250	35.8	1280	102.8	2.46	265	38.4	1060	90.8
"	$MgCl_2$	2.30	267	33.2	1087	100.4	2.27	251	37.5	1146	90.3	2.28	273	38.0	1020	84.7
"	$RNH_2 \cdot HCl$	2.48	270	37.0	1086	93.2	2.45	257	38.9	1187	94.9	2.53	267	38.3	966	86.2

[1]Fabrics stored for 35 days at 70°F and 65% relative humidity.
[2]Values given under these headings are for original untreated fabric.
[3]Treating bath also contained emulsified polyethylene as an additive.

evident then, that unless DMEU-treated fabric is given a good process wash, the cloth might as well be treated with the much cheaper UF as far as chlorine resistance is concerned.

With DMET the results are variable but the question is somewhat academic in that the strong fish-like odor of fabric treated with DMET makes a good afterwash a necessity.

With the DMP finish there was comparatively little change in chlorine resistance but there was a loss of about eight to 25% of the nitrogen content on washing after 35 days of storage. This was reflected in the considerable loss in wrinkle resistance. Crease recovery angles dropped 16 to 31° and are below the usually accepted minimum of 240° for good wrinkle resistance. These data indicate that the acid hydrolysis which occurs in the unwashed samples on storage results in complete removal of some of the DMP cross-links rather than partial cleavage; the latter would have increased chloramide formation.

There was also a slight loss of wrinkle resistance of MMF samples which were stored unwashed. These samples lost little strength in the scorch test although they yellowed upon exposure to hypochlorite bleach.

Because of results obtained in this set of experiments, the effect of more extended storage on chlorine resistance of selected finishes was studied. The following finishing agent-catalyst systems were selected because they are combinations which are often used commercially. The systems were UF-amine hydrochloride, DMET-zinc nitrate, DMP-zinc nitrate, MMF-magnesium chloride, and DMEU with the three catalysts. Finished fabrics were stored without being process washed and samples were periodically tested for chlorine damage over periods up to 65 to 80 days.

A plot of the results obtained with the first four finishes is shown in Figure 1. The samples were not laundered before testing. The DMP finish had the best retention of its original chlorine resistance. In addition to the points shown in Figure 1, a sample of DMP-finished cotton fabric was found to retain 86% of its original strength in the scorch test after 106 days of storage without having been process washed.

DMET-finished cotton also retained good resistance to the scorch test after extended storage without a process wash.

Surprisingly, fabric finished with MMF exhibited a small but constant

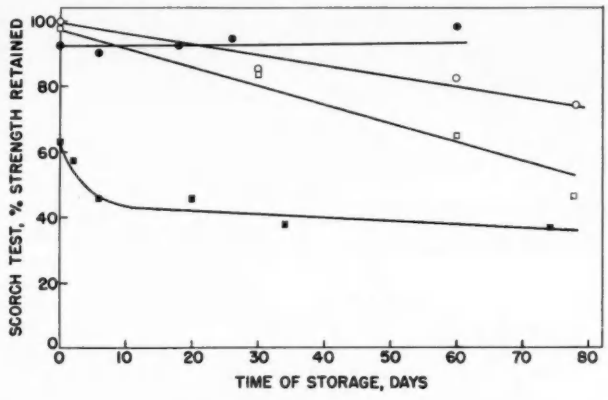

Figure 1
Chlorine damage of cotton fabrics finished with DMP (●), with DMET (○), with MMF (□), and with UF (■), and stored without an afterwash.

increase in chlorine damage over the storage period. Strength retention in the scorch test was only 46% after 78 days of storage. Usually, the effect of chlorine bleach on commercially treated MMF-finished cloth is discoloration with little strength loss. However, data here indicate that, without a process wash, strength loss can also be a consequence.

Cotton fabric finished with UF had poorer chlorine resistance than the other finishes at the start of the storage period. It suffered additional loss of resistance in the early stages of storage but apparently reached a relatively constant level of damage after about one week.

Figure 2 shows the plot of similar data obtained on fabric treated with DMEU using three different catalysts and stored without a process wash. Although the fabrics had good chlorine resistance originally, there was a rapid loss of resistance in the early stages of storage. In 21 days the fabrics retained less than 50% of their original strength in the scorch test. At this point the rate of loss became slower but continued until strength retention after 64 days of storage was about 21%. A comparison of these data with those of Figure 1 show that after about 30 days storage without a process wash, the DMEU finishes suffer even greater chlorine damage than does the UF-finished fabric. The latter is generally considered to have the poorest chlorine resistance of all the common N-methylol-finished cottons.

The finishes are stable to chlorine damage over long periods of time if the cloth is given a good afterwash. A number of finished fabrics were available which had been stored for

TABLE II

Stability to chlorine damage of finished cotton fabrics process-washed before prolonged storage

Finishing agent and catalyst used	*Storage time, months*	*Chlorine damage, % orig str retained*
UF—$RNH_2 \cdot HCl$[1]	16	74.1
DMEU—$Zn(NO_3)_2$	16	98.5
DMET—Organic acid	16	85.6
DMP—$Zn(NO_3)_2$	5	97.6
MMF—$MgCl_2$	16	100.0

[1]Urea-formaldehyde with 1:2 ratio

TABLE III

Change[1] in properties of "wash-and-wear" cottons when stored without an afterwash

Finish	*Chlorine damage*	*Wrinkle resistance*	*Odor*[2]
UF	Little difference	Little difference	Moderate formaldehyde
DMEU	Serious increase	Little difference	Strong formaldehyde
DMET	Slight increase	Little difference	Fish-like and moderate formaldehyde
DMP	Little difference	Serious decrease	Strong formaldehyde
MMF	Moderate increase	Slight decrease	Moderate formaldehyde

[1]Presuming a good cure. Listed are the properties after about two months storage of fabric processed without an afterwash as compared with stored samples of the same finish washed after the cure.
[2]Based on the data presented in the previous paper of this series (5).

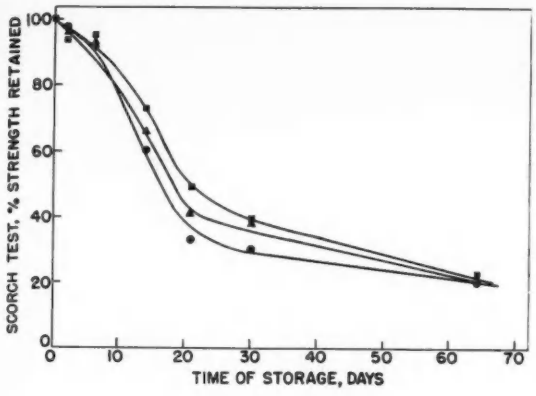

Figure 2
Chlorine damage of cotton fabrics finished with DMEU using $Zn(NO_3)_2$ (●), $MgCl_2$ (■), and $RNH_2 \cdot HCl$ (▲) catalysts, and stored without an afterwash.

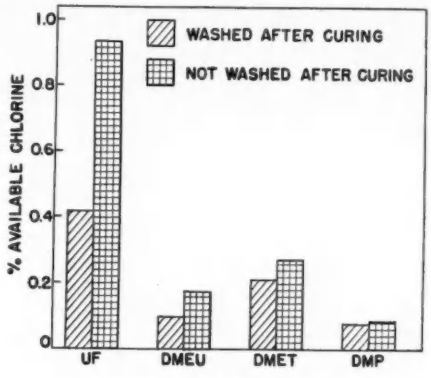

Figure 3
Chlorine retention, determined by titration, of finished cottons after 10 months storage.

a considerable period of time as listed in Table II. Although finished samples are not identical with those previously discussed, they are comparable except in the case of the UF sample, which was treated with a precondensate which had a ratio of two formaldehyde residues to one urea compared to the more usual 1.6 to one. Resistance of the former to chlorine degradation is much greater than the latter (*10*).

The greater loss of chlorine resistance by samples which have not been afterwashed is due to increased chlorine retention. This is borne out by data presented in Figure 3 for samples with four finishes after storage for 10 months. The fabric samples titrated were finished with UF-$RNH_2 \cdot HCl$, DMEU-$Zn(NO_3)_2$, DMET-$Zn(NO_3)_2$, and DMP-$Zn(NO_3)_2$. No data for a melamine finish are included because of the transitory end-point with finishes of this class.

SUMMARY AND CONCLUSIONS

Cotton fabrics treated for wrinkle resistance and "wash-and-wear" properties with five types of N-methylol finishing agents have been investigated after various periods of storage. Particular emphasis was placed on the resistance of the samples to chlorine damage although other properties including breaking strength, tearing strength, and wrinkle resistance were determined.

It has been found that the process wash after the curing step of finishing is extremely important in retention of the valuable properties imparted by the finishing agents. Since there is always some time delay before the finished fabric reaches the consumer, it must be stored for varying periods of time. A general summary indicating the importance of the process wash on stored fabric is given in Table III. Included in this table are comments on odor development from the previous paper of this series (*5*).

Cotton finished with DMEU exhibits a severe loss of chlorine resistance in a very short time if not washed after curing. Fabric finished with DMP and not afterwashed is affected in a different way—the material suffers a considerable loss of wrinkle resistance. Susceptibility to chlorine damage also is increased by failure to wash cotton treated with MMF or DMET. Treatment with UF, of course, yields a product with such poor chlorine resistance that the process wash-storage effect is not pronounced.

In general, therefore, a combination of the data derived in the present study and that disclosed in the foregoing study of the release of formaldehyde from finished fabrics (*5*) illustrate the desirability of a thorough wash after curing with these finishing agents. Unwashed fabric gradually deteriorates in performance characteristics, particularly in resistance to damage from chlorine bleaches and possibly in wrinkle resistance, and evolves annoying and perhaps health-damaging fumes and odors.

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General Calendar

AMERICAN COTTON MANUFACTURERS INSTITUTE
Mar 23-25 (12th Annual Meeting, Fontainebleau Hotel, Miami Beach, Fla)

CANADIAN TEXTILE CONFERENCE
Feb 7-9 (Queen Elizabeth Hotel, Montreal, Quebec, Canada)

CHEMICAL EXPOSITION USA
Sept 13-15 (Statler Hilton Hotel, New York, NY)

INSTRUMENT SOCIETY OF AMERICA
Sept 26-30 (Annual Meeting, Instrument-Automation Conference and Exhibit, New York, NY)

INTERNATIONAL TEXTILE MACHINERY EXPOSITION
1962 (3rd Exposition, Hanover, Germany)

NATIONAL COTTON COUNCIL
Sept 28-29 (9th Chemical Finishing Conference, Statler Hotel, Washington, DC)

SOUTHERN TEXTILE EXPOSITION
Oct 3-7 (Greenville, SC)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION
Sept 13, Oct 11, Nov 10, Dec 8 (Hotel Roosevelt, New York, NY)

TEXTILE TECHNICAL FEDERATION OF CANADA
Sept 7-8 (Seventh Canadian Textile Seminar, Queen's Univ, Kingston, Ont, Canada)

TEXTILE OPERATING EXECUTIVES OF GEORGIA
Oct 22 (Harrison Hightower Bldg, Georgia Inst of Technology, Atlanta, Ga)

WORLD CONGRESS FOR MAN-MADE FIBERS
May 15-18, 1962 (2nd World Congress, London, England)

Abstracts

Infrared and Allied Heating Methods

Moule, G H, *Dyer 123, 97-8, Jan 15, 1960*

Traditionally, steam has been used as the source of heat in all the various drying processes associated with the textile industry, for reasons of economy, the author states, and there has been little incentive to consider other, perhaps more compact, forms of heating.

He outlines the general mechanism of infrared heating and its advantages and disadvantages, hoping thereby to stimulate thinking in this direction.

Infrared radiation is similar to light in that it may be transmitted, reflected, refracted and absorbed, according to the waveband covered by the radiation and the physical characteristics of the material receiving it.

The great advantage which infrared heating has over convection heating methods is the simplicity of the equipment required to achieve very high rates of heat transfer.

There are two main infrared heat sources available and in general use in England: the tungsten filament lamp and the tubular sheathed element. The latter is used to a much greater extent than the lamp for two reasons:

1) The wavelength emitted has a much wider subject acceptance (12,000 to 80,000 Angstrom units).

2) It is more robust than the lamp and therefore maintenance costs are lower.

So far as applications in the textile industry are concerned, the greatest use of infrared has been in providing a boost for existing plant. Generally, the object has been either to increase heating capacity without increasing plant size, or to provide higher temperature conditions than is possible with steam to suit new processes (eg, the setting of synthetic fibers).

When infrared heat is used for the removal of moisture, as in drying operations, the tubular sheathed element is superior to the lamp, since moisture is more susceptible to the wave lengths generated by the former, the author states. He gives examples of the short drying times that can be achieved by the use of infrared.

One application where infrared has been used extensively is in the drying of latex rubber dispersions used for the backing of needleloom felt and tufted carpets. In this application the dispersion is sprayed or spread on the back of the carpet, which is then passed through a tunnel fitted with radiant emitters.

Heat treatment to set synthetic fibers and fabrics such as nylon, Terylene and Orlon, can be achieved in steam or dry heat, the latter requiring higher temperatures (200-220°C). Steam setting is a fairly lengthy process, requiring rather bulky plant. By contrast, the short heating cycle time which can be achieved by radiant heating enables compact, simple equipment to be employed.

The author also discusses the cost of installation of infrared equipment.

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Carriers in the Application of Disperse Dyes

Stead, E, *Dyer 123, 187, 189, Jan 29, 1960*

Disperse dye powders consist essentially of tiny particles of dye (1-5μ diameter) embedded in a water-soluble dispersing agent; stirring into warm water gives a fine dispersion, the dye particles being prevented from clinging to each other by the protective colloid action of the dispersing agent.

Although disperse dyes are essentially hydrophobic and substantially insoluble in cold water, they do dissolve to a slight extent at normal dyeing temperatures of 60-100°C. The dissolved molecules are attracted to the surface of hydrophobic fibers such as cellulose acetate, nylon, Terylene and polyacrylonitrile, but unless they can diffuse readily into the fiber substance the surface quickly becomes saturated with quite a small amount of dye, and dyeing comes to a standstill at this stage, if carriers are not used.

Carriers assist dyeing of hydrophobic fibers by increasing the rate of diffusion, and most of them swell the fiber by penetrating into and opening up their tight molecular structures.

Small, active molecules in general dye more readily than larger, more sluggish ones. Rapid-dyeing dyes in general build up and level readily and have good temperature range properties. Slow-dyeing dyes are of higher wetfastness properties because they do not readily diffuse outwards into the wash liquors, but their building-up, leveling and temperature range properties are generally inferior to those of the rapid-dyeing ones. Many disperse dyes of high fastness to light and sublimation belong also to the slow-dyeing class.

Apart from variation in diffusing powers exhibited from dye to dye, the hydrophobic fibers themselves vary widely in the ease with which a given dye can diffuse into them. In secondary cellulose acetate and nylon, diffusion proceeds relatively rapidly, but in Terylene, due to the closeness of its molecular structure, even the smallest and most active disperse dye molecules can only diffuse slowly at temperatures up to the boil. At a dyeing temperature of 120-130°C, however, Terylene dyes readily with suitable dyes.

Tricel is intermediate in closeness of structure between secondary acetate and Terylene. Consequently, rapid-diffusing dyes can diffuse completely into it during normal dyeing times of 1-2 hours at temperatures of 95-100°C, and no advantage is gained by using a carrier on Tricel with these dyes under these dyeing conditions. If, however, a lower dyeing temperature has to be used, a carrier is helpful. With slow-diffusing dyes of high light and sublimation fastness, a carrier gives greatly increased yield.

It is pointed out that ortho- and paraphenylphenol, which are widely used as carriers, reduce the lightfastness of many disperse dyes.

In dyeing mixtures of fibers, carriers become an important tool in the hands of the skillful dyer and enable him to influence the distribution of dye between the different fiber constituents.

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Latest Word on Low-cost Mill Waste Disposal

Anon, *Textile World 110, 71-5, June, 1960*

Mill wastes have three primary characteristics (all of which used to be far more costly to overcome than they are today): they tend to be high in biological oxygen demand (BOD), they are often highly alkaline and sometimes highly colored, and often they have a bad smell, particularly if they are sulfur-dye wastes.

The author describes five ways in which mills can reduce stream pollution by changing the method of handling their wastes:

1) By cutting the volume of raw

(*continued on page 36*)

Proceedings of the
American Association of Textile Chemists and Colorists

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July 25, 1960 No. 15

AATCC Committee on Colorfastness to Washing, RA60———

THE DEVELOPMENT OF A MECHANICAL TEST EQUIVALENT TO FIVE AVERAGE HAND WASHINGS

RALPH B SMITH
Past Chairman, Committee RA60

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*Immediate past chairman (1957-59)

THE colorfastness of a dyed or printed fabric to washing has been very completely investigated over the last fifteen years and as a result, the Accelerated Washfastness Tests, Nos. IIA, IIIA and IVA, have been carefully and satisfactorily worked out. This range of testing, however, leaves out a test for hand washing.

When the currently used tests were developed, an attempt was made in a limited manner to develop a hand wash test, but the results obtained at that time indicated that there was little room below the IIA test, and after a few runs, the matter was dropped. When the problem came up last lear, it was decided to try to get a sufficient number of pieces of material which were truly hand washable, but were not washable by the IIA test, and to use these pieces to develop a test method.

The need for this test had been partially filled by using the No. I Test of 36-1957, but this test has been removed from use by the decision to make this a test for characterization of textile colorants, and a hand wash test was therefore necessary if there was to be a complete series of tests.

Seven samples of dyed and printed fabrics were selected which met the general requirements for colorfastness and these were sent to six members of the Committee for a prescribed hand washing test. A similar set also was washed at the AATCC Laboratories. All of these samples were hand washed five times and were returned to the AATCC Laboratories where the average washed sample of each fabric was selected as the basis for the development of a mechanical hand washing test.

While these samples were being washed, the No. I Test of 36-1957 was tried out under various conditions of temperature, time, steel balls, alkali, and soap concentration on the old No. 1 standard dyed fabric. This work led to the decision to set the soap solution concentration at 0.5% and to use no alkali in the test procedure. The temperature of the washing solution was to be 105°F.

When the five-wash samples were returned to the AATCC Laboratories, a laboratory method was developed through washing samples under various conditions of liquor volume, number of steel balls, time, rubber vs steel balls, and metal tubes vs glass jars. In all, 35 different conditions were tried in this series, and out of these, nine were selected for comparison with the original samples and the average hand-wash samples. Mounted samples were exhibited to the Committee, which selected one set which called for washing 2″ × 4″ specimens in a glass jar, using 200 ml of a 0.5% soap solution, 10 steel balls and running the test for 45 minutes. This test method produced a good correlation with the color removed by five average hand washings, but produced somewhat more staining.

COLORFASTNESS OF TEXTILES TO COMMERCIAL COLORFASTNESS OF TEXTILES TO COMMERCIAL LAUNDERING AND DOMESTIC WASHING

Accelerated Tests
Tests Nos. IA, IIA, IIIA and IVA

*Tentative Test Method 61-1960**

PURPOSE AND SCOPE —— These accelerated laundering tests are especially designed for evaluating the washfastness of textiles which are expected to withstand frequent laundering. The color loss resulting from solution and/or abrasive action of five average hand, commercial, or home launderings, with or without chlorine, are closely approximated by one 45-minute test (*1*).

PRINCIPLE —— Specimens are laundered under appropriate conditions of temperature, alkalinity, bleaching, and abrasive action such that the desired loss of color is obtained in a conveniently short time. The abrasive action is accomplished by the use of throw, slide, and impact, together with the use of a low liquor ratio and an appropriate number of steel balls.

APPARATUS AND MATERIALS

Launder-Ometer (description on page 90, *1959 Technical Manual*) or similar apparatus for rotating closed containers in thermostatically controlled water bath at 42 rpm (*2*).

Pint glass jars, 3″ × 5″ for the IA test (*2*).

Stainless-steel cylindrical containers 3½″ × 8″ for the IIA, IIIA, and IVA tests (*2*).

Metal adapters (to hold containers on shaft of Launder-Ometer) (*2*).

Stainless-steel balls (*2*).

Flatiron (*3*).

Multifiber test fabric (*2*).

Cotton fabric, 80 × 80, bleached, desized (*2*).

Soap, neutral chip (*4*).

Sodium metasilicate, technical ($Na_2SiO_3 \cdot 5H_2O$).

Acetic acid, 28%.

Water, distilled (*5*).

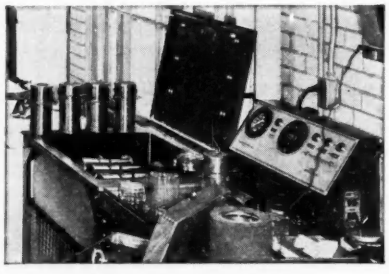
Sodium hypochlorite (*6*).

TEST SPECIMENS——

2″ × 4″ for IA Test

2″ × 6″ for IIA, IIIA & IVA Tests

One specimen is needed for each container. Prepare pieces with a 2″ square of multifiber cloth or white cotton cloth sewed or stapled along one 2″ edge of the test specimen and in contact with the face of the material. When multifiber test cloth is used, attach so that each of the six fiber stripes is along the 2″ edge of the specimen. It is recommended that knitted fabrics be sewn or stapled at the four edges to equivalent-size pieces of 80 × 80 bleached muslin to avoid rolled edges and to assist in obtaining a uniform test result over the entire surface.



Launder-Ometer showing stainless-steel cylindrical containers

PROCEDURE——Table I summarizes the conditions of the tests.

Adjust the Launder-Ometer to maintain the designated bath temperature. Prepare the required volume of wash liquor. Preheat this solution to the prescribed temperature and add the correct volume for each test to separate containers.

The IA Test is run in pint glass jars. Add 10 steel balls to each jar and clamp the covers. Fasten the jars onto the rotor of the Launder-Ometer, arranged so that an equal number of jars is on each side of the shaft. Start the Launder-Ometer and run for 45 minutes.

The IIA, IIIA, and IVA tests are run in the stainless-steel tubes. It is recommended that the chlorine for the IVA test be added to each 50-ml portion of the wash solution in the form of five ml of a 0.165% available chlorine solution, buffered to a pH of 11, just before entering the test specimen. Add the designated number of stainless-steel balls to each container and clamp the covers. Fasten the containers horizontally in the adapters on the rotor of the Launder-Ometer with the covers facing the operator and arranged so that an equal number of containers is on each side of the shaft. Start the rotor and run for not less than two minutes to preheat the containers. Stop the rotor and with a row of containers in an upright position, unclamp the cover of one container, enter a well-crumpled test specimen into the solution and replace the cover, but do not clamp it. Repeat this operation until all the containers in the row have been loaded. Then clamp the covers in the same order in which the containers were loaded (cover clamping is delayed to allow equilization of pressure). The other containers are loaded in a similar manner. Start the rotor and run for 45 minutes.

The rinsing, souring, extraction, and drying methods are the same for all tests. Stop the machine, remove the containers and empty the contents. Rinse each test specimen twice, in beakers, in fresh 100-ml baths of water at 105°F (40°C) for one-minute periods with occasional stirring or hand squeezing. Sour in 100 ml of a 0.014% solution of acetic acid (0.05 ml of 28% acetic acid per 100 ml of water) for one minute at 80°F (27°C). Rinse again for one minute in 100 ml of water at 80°F (27°C). Hydroextract or pass the test specimens between wringer rolls to remove excess moisture. Dry by pressing with an iron (275-300°F) (135-150°C) (*3*) with the multifiber or white cotton cloth uppermost and in contact with the face of the test specimen.

INTERPRETATION OF RESULTS ——The conditions which are obtained in these tests give results which correlate with the results of five average home or commercial launderings. These are accelerated tests, and in obtaining the required degree of acceleration some of the conditions, such as temperature, were purposely exaggerated. These tests are satisfactory consumer end-use tests, and the correlation with average laundry practice is explained as follows:

Test No. IA. This test is especially designed for evaluating colorfastness of fabrics that are expected to with-

*Tentative Test Method 61-1960 was approved by TCR in January, 1960

TABLE I

Test No.	Containers	Temp (°F)	Temp (°C)	Specimen size (inches)	Liquor volume (ml)	Soap (%)	Sodium metasilicate (%)	Available chlorine (%)	Steel balls (number)	Time (mins)
IA	Glass jar	105	40	2 × 4	200	0.5	0	0	10	45
IIA	Stainless-steel cyl	120	49	2 × 6	150	0.2	0.2	0	50	45
IIIA	Stainless-steel cyl	160	71	2 × 6	50	0.2	0.2	0	100	45
IVA	Stainless-steel cyl	160	71	2 × 6	50	0.2	0.2	0.015	100	45

stand repeated hand washing at low temperature. Specimens subjected to this test will show color change similar to that produced by five average careful hand launderings at a temperature of 105°F.

Test No. IIA. This test is designed for evaluating the washfastness of fabrics that are expected to withstand repeated careful machine washing in the home or in the commercial laundry at low temperatures. Specimens subjected to this test will show color damage similar to that produced by five average careful home or commercial launderings at low temperature.

Test No. IIIA. This test is especially designed for evaluating washfastness of fabrics considered washable under vigorous conditions. Specimens subjected to this test should show color damage similar to that produced by five average commercial or home launderings (without chlorine).

Test No. IVA. This test is designed for evaluating the washfastness of textiles which may be laundered in the presence of available chlorine, such as prints or colored patterns where there is a contrasting white effect. Specimens subjected to this test should show color damage similar to that produced by five average commercial launderings with chlorine (white-wash formula).

EVALUATION METHOD FOR ALTERATION IN COLOR (SHADE AND STRENGTH)——The effect on the color of the test specimens can be expressed and defined by reference to the International Geometric Gray Scale (*2*).

Class 5—negligible or no change as shown in Gray Scale Step 5.

Class 4—a change in color equivalent to Gray Scale Step 4.

Class 3—a change in color equivalent to Gray Scale Step 3.

Class 2—a change in color equivalent to Gray Scale Step 2.

Class 1—a change in color equivalent to Gray Scale Step 1.

EVALUATION METHOD FOR STAINING——Staining can be evaluated by means of the AATCC Chart for Measuring Transference of Color (*2*) or the Geometric Staining Scale. The means should be indicated when reporting the test results.

Class 5—negligible or no staining.

Class 4—staining equivalent to Row 4 on the AATCC Chart or Step 4 on the Geometric Staining Scale.

Class 3—staining equivalent to Row 3 on the AATCC Chart or Step 3 on the Geometric Staining Scale.

Class 2—staining equivalent to Row 2 on the AATCC Chart or Step 2 on the Geometric Staining Scale.

Class 1—staining equivalent to Row 1 on the AATCC Chart or Step 1 on the Geometric Staining Scale.

NOTES——

(*1*) See *1951 Technical Manual and Year Book*, pages 73 and 88.
(*2*) See Table 1, page 54, *1959 Technical Manual*.
(*3*) See note (3), page 101, *ibid.*
(*4*) See note (4) page 101, *ibid.*
(*5*) See note (5), page 101, *ibid.*
(*6*) See note (2), page 93, *ibid.*

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES
Sept 8-9 (Atlanta, Ga); Sept 8—Council Committees and Research Committees; Sept 9 (AM)—ECR, TCR; Sept 9 (PM)—Council Nov 17-18 (New York, NY); Nov 17—Council Committees and Research Committees; Nov 18 (AM)—ECR, TCR; Nov 18 (PM)—Council

NATIONAL CONVENTIONS
Oct 6-8 (Sheraton Hotel, Philadelphia, Pa); Sept 28-30, 1961 (Buffalo, NY); 1962 (Southern Region); 1963—Boston; 1964—New York; 1965—Chicago

DELAWARE VALLEY SECTION
Sept 16 (Reading, Pa); Nov 4, Dec 9 (Philadelphia, Pa)

NIAGARA FRONTIER SECTION
Sept 23 (Buffalo, NY); Nov 4 (Annual Business Meeting, Buffalo, NY); Apr 7 (Joint meeting with Ontario Section, CATCC, St Catherines, Ont); May 18 (Buffalo, NY)

NORTHERN NEW ENGLAND SECTION
Sept 9 (Outing—Wachusett Country Club, West Boylston, Mass); Oct 21 (Hotel 128, Dedham, Mass—"Customer Service"—Arthur Swenson, J P Stevens & Co, Inc, and P J Fynn, J C Penney Co); Dec 9 (Colonial Country Club, Lynnfield, Mass—"Present-day Economic Outlook in Textiles"—William I Kent, Kent Mfg Co); Jan 20 (Hotel 128, Dedham, Mass—Symposium on "Mechanical and Chemical Finishing of Textile Fabrics"—John J McDonald, Lowell Technological Inst, D D Gagliardi, Gagliardi Research Corp, and Werner von Bergen, J P Stevens & Co, Inc)

PACIFIC SOUTHWEST SECTION
Sept 24-26 (Outing—Apple Valley, Calif); Nov 18 (Rodger Young Auditorium, Los Angeles, Calif); Dec 10 (dance)

PIEDMONT SECTION
Sept 23-24 (Hotel Charlotte, Charlotte, NC); Jan 21 (Poinsett Hotel, Greenville, SC); April 2 (Washington Duke Hotel, Durham, NC); June 9-10, 1961 (Outing—Grove Park Inn, Asheville, NC); Sept 23, 1961 (Hotel Charlotte, Charlotte, NC)

RHODE ISLAND SECTION
Sept 23 (Management Night); Oct 28 (Providence Engineering Society); Dec 2 (Annual Meeting—Johnson's Hummocks)

SOUTH CENTRAL SECTION
Sept 17 (Andrew Jackson Hotel, Knoxville, Tenn); Dec 9 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION
Sept 10, Dec 3 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION
Sept 23 (Blake's Restaurant, Springfield, Mass); Oct 21 (Annual Meeting, Rapp's Restaurant, Shelton, Conn); Dec 2 (Rapp's Restaurant, Shelton, Conn)

Rhode Island Section———

INCORPORATION OF ULTRAVIOLET ABSORBERS IN TEXTILES*

D J DELANO**

Student, Bradford Durfee College of Technology

Fall River, Mass

INTRODUCTION

THE object of this paper is to illustrate the possibility of incorporating ultraviolet absorbers in textiles.

Light consists of a stream of photons possessing an amount of energy that is proportional to its wavelength. Ultraviolet light is that which has a wavelength up to 400 millimicrons. This is the portion of the spectrum that contains the highest energy.

It is believed that a compound will absorb light only if it can utilize the energy that the light possesses. This energy can be used in a variety of ways, such as allowing the electrons to go into a higher energy level, or by bringing about the increased resonance within the molecular structure.

Ultraviolet absorbents are compounds that have the ability to utilize the energy of the ultraviolet light without altering their final chemical structure.

Many dyes also absorb ultraviolet energy but are adversely affected by this reaction. Therefore it is the purpose of this paper to illustrate the possibility of decreasing this effect by protecting the dyes and pigments on the fabric by the incorporation of ultraviolet absorbents.

PIGMENT PRINTING

The first step was to attempt to eliminate the yellowing of a print made with titanium oxide and a butadiene styrene latex. Five samples of a standard past mix were prepared, each containing 10 grams of titanium oxide pigment, 10 grams of the latex, and 100 grams of a water-base cut. To four of the samples was added varying percentages of a dihydroxymethoxybenzaphenone from 0.1 to 1.0% as the absorbent. The absorber was dissolved in small amounts of isopropyl alcohol and quickly dispersed into separate samples of print mix. Prints were then made with each of the five samples and cured at 350° F for three minutes. At the end of this cure, a yellowing effect on all of the samples was noted. Using the sample that did not contain any absorber as a standard, all the samples were exposed for 20 hours in a Fade-Ometer.

After the exposed samples were examined, it was found that the samples which contained the ultraviolet absorbers remained on the yellow side while the control sample without the absorber became whiter than it was immediately after the cure. From this observation it was concluded that the yellowing effect was caused by the cure rather than the exposure to light. As a matter of fact, the exposure to ultraviolet light aided in whitening rather than yellowing, as was illustrated by the retention of the yellow cast of the samples that were protected by the ultraviolet aborbers. Also due to the fact that the absorbents on hand imparted a slight yellow cast themselves, it was decided to abandon this area of investigation.

The remainder of the experimental work for this project was divided into two parts: first, the incorporation of various absorbents into print pastes of resin-bonded pigments; and second, the aftertreatment of dyed fabrics with solutions of resins and ultraviolet absorbers.

In order to better observe the effect of the exposure of the pigments to light, an acrylic latex was used which in itself is not effected to any extent by light. Therefore, any fade or change in shade could be attributed to a change in the pigment itself.

The first experiment along this line was to prepare five samples of a standard mix of 100 grams of a water-base cut, five grams of the acrylic binder, 0.5 grams of CI Pigment Yellow 12 and a trace of a blue pigment to afford better observation of any change of shade.

To four of these samples was added small amounts of a water-soluble derivative of benzaphenone as the ultraviolet absorbent. The amounts were from .0025% to .05%. Here again the sample that did not contain any absorber was used as the control sample. After 40 hours of exposure, all the samples were severely faded. Any improvement by the absorbers was too small to be noticed.

This failure of the absorbers to be of any value can be attributed to the fact that very small amounts were used and that the absorber in this case was water soluble and would have greater affinity for the water-base cut than it would for the resin that surrounds the pigment. With this conclusion, it was decided to prepare a mixture of the same pigment (CI Pigment Yellow 12), only this time a water-insoluble benzaphenone derivative was used as the absorber and in much larger amounts. Also in order to reduce the length of time necessary to obtain a noticeable fade, the amount of pigment was reduced from 0.5 grams to 0.1 grams per 100 grams of print mix.

In order to get this water-insoluble absorber into the print mixture, it was dissolved in as small an amount as possible of isopropyl alcohol and quickly dispersed into the paste. This is not a very satisfactory dispersion for in time it will separate, but by quickly applying the mixture to the fabric and giving a mild heat treatment before the actual cure to evaporate the alcohol one may obtain a suitable application for experimental work. However, further work should be done to develop a more suitable dispersion for this concentrated medium.

In this manner two sample mixtures were prepared, to one of which was added 1% of the absorber. This addition imparted a slight yellow cast but was suitable for observation on a comparative basis. Both samples were then exposed in the Fade-Ometer. The control sample, containing no absorber, started to fade

*Presented at the Student Night meeting of the Rhode Island Section held April 29, 1960 at Providence, RI.

**This work was carried out at Bradford Durfee College of Technology under the supervision of Prof Carl E Medde.

after 12 hours, but the sample containing the dispersed absorber took between 25 and 30 hours for a noticeable fade. This represents an improvement of almost 250%.

Several exposures were made of samples of the same standard yellow print mix with samples containing 1% of the water-soluble absorber. It was found that these prints obtained a noticeable fade after 16 hours. This is a 30% improvement over the control sample. Also on prolonged exposure, the protected sample resisted fading better than the control sample. In general, however, the water-insoluble absorber gave far better protection in all concentrations than did the water-soluble absorber.

The next line of testing was on pigments of extremely poor lightfastness. The print mix was made up as before, only doubling the strength of the pigment. The pigment used in this case was a brilliant red fluorescent pigment. To one sample of this mix was added again a quantity of absorber, dihydroxymethoxybenzaphenone, equal to 1% of the final mix. It was dissolved in isopropyl alcohol and dispersed in the paste. Both samples were exposed in the Fade-Ometer and after a 2.5-hour exposure, it was found that the sample containing the absorber faded far more severely than did the control sample. This is in direct contrast to the results of previous experiments. However, bearing in mind the fact that dyes and pigments are also affected by the visible part of the spectrum as well as the ultraviolet, the following explanation for this unexpected result is proposed.

As stated before, a compound will absorb light if the light is of an energy level that can be used by the compound, in this case a pigment. Therefore, if the energy from the ultraviolet was too high to be absorbed by this particular pigment, it would just pass through. In the case of the control sample, this is probably what happened, and the fading that took place was due to the energy absorbed by the pigment from the visible light. However, when the ultraviolet light reached the sample containing the ultraviolet absorbent, its energy was absorbed. The absorbent now in an excited state due to electrons in a higher energy level is able to convert this acquired electromagnetic energy into kinetic energy by collision with molecules of the pigment. In this manner, there is additional energy in the system that would have been passed by if it were not for the absorbent. The energy acquired in this manner may be of the same level necessary to cause fading for this particular line of pigments. The energy need only be sufficient to catalyze reactions such as oxidation, reduction, or elimination that would result in a change of shade.

The final experiment with print pastes was with CI Direct Red 80 dispersed in a standard print paste of sodium alginate. To the standard paste of one sample was added 1% of a sulfonated derivative of hydroxymethoxybenzaphenone as the absorber, and 5% of an acrylic binder for the absorber. Both the control sample and the treated sample were then printed and cured. Both samples were exposed for 10 hours and on examination an approximate improvement of about 25% for the treated fabric was estimated.

AFTERTREATMENT OF PIECE-DYED FABRICS

The first experiment dealing with the aftertreatment of piece-dyed goods with ultraviolet absorbents was on a cotton fabric dyed with CI Direct Red 26. A paste was formed from the absorber and a sulfonated fatty alcohol, and then dispersed into dihydroxymethoxybenzaphenone. This mixture was then padded along with 5% latex onto the fabric and cured at 300°F for three minutes. This resulted in a spotted fabric due to the fact that a partial cure took place in the padding liquor.

Time was devoted to finding a better dispersion for this absorber in a high liquor ratio, and the following method was found to be quite satisfactory.

The partical size of the water-insoluble absorber was reduced by agitation in a ball mill with a 1 to 20 water ratio. This dispersion was then diluted to a 1 to 100 water ratio and padded along with 5% of latex on a cotton fabric dyed with 16 lbs/100 gallons of Superlitefast Blue 8GLN on the Swedish Pad-Roll Dyeing Machine. Treatment with sodium m-nitrobenzenesulfonate and a commercial dye-fixing agent followed.

Another sample of the same fabric was treated with a padding liquor containing 1% of a water-soluble absorber and 5% latex. Both samples and a sample of the same fabric that was not padded with an absorbent were exposed in the Fade-Ometer. Both samples padded with ultraviolet absorbents took 7.5 hours to equal the fade obtained by the control sample at five hours.

CONCLUSION

From these experiments it was concluded that it is possible to impart improved lightfastness to dyes and pigments by the use of ultraviolet absorbers. It was found that the best area of application of these absorbers would be in conjunction with dyes of fairly good fastness. With the additional fastness rendered by the ultraviolet absorbers, these dyes and pigments would be suitable for goods that require optimum lightfastness. However, it is felt that further work should be done in the line of developing an absorber that is colorless.

AATCC Deceased

Member	*Section*
LEON W SIDEBOTTOM 490 Brook Rd Milton, Mass	NNE
ROSS C RODGERS Scholler Bros Ltd St Catherines, Ont Canada	—

NOMINEES FOR NATIONAL OFFICES

THE following slate of officers for 1960 was offered to the Council at its May meeting:

For president, Elliott Morrill, The Best Foods, Inc, Indianapolis, Ind

For reelection as vice presidents,

New England Region—W George Parks, Univ of Rhode Island, Kingston, RI

Central Atlantic Region—William S Sollenberger, American Viscose Corp, Marcus Hook, Pa

Southern Region—A Henry Gaede, Laurel Soap Mfg Co, Charlotte, NC

Western Region—Joseph H Jones, Phoenix Dye Works

ACTIVITIES OF THE LOCAL SECTIONS

Pacific Southwest

PACIFIC SOUTHWEST SECTION will hold its annual outing the weekend of September 24 at the Apple Valley Inn, Apple Valley, Calif, about two hours' drive from Los Angeles.

Golf, riding, swimming, tennis and "loafing" will be the order of the day. A dinner, dance and floorshows will be featured on Saturday night.

Full information may be obtained from Dave Sanders, National Dyeing & Finishing Corp, 3505 Hayden, Culver City, Calif.

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Mid-West

THE 28th Annual Outing of the Mid-West Section was held June 17-18 at Cerami's Island View Resort on Brown's Lake, Burlington, Wis, with 118 in attendance, 74 of which played golf. Other activities included horseshoe pitching and shuffleboard. The outing was concluded with a cocktail party, followed by a banquet and awarding of prizes.

Louis Hoehn Jr, Nyanza Color & Chemical Co, was the winner of the Jimmy Demeret set of golf clubs. Winner of other golf events were as follows:

Twilight golf—J Jones, Phoenix Dye Works, and A Hultberg, Bear Brand Hosiery Co, 42s.

Low gross, guest—J Morrison, Reilly, Whiteman, Walton Co, 74.

Low gross, millmen—J Jones and A Hultberg, 89s.

Low gross, suppliers—R Powers, Koppers Co, 79.

Low net, millmen—T Hall, U S Rubber Co, 122-78-44.

Low net, suppliers—W Jaeger, American Cyanamid Co, 131-84-47.

Low net, Flight I—W Boyd, Ciba Co, Inc, 94-39-55; W Mode, Bettersox Knitting Mills, 95-33-62; R Turner, E I duPont de Nemours & Co, Inc, 93-30-63.

Low net Flight II—W Broadbent, Geigy Dyestuffs, 102-48-54; E Larret, Rohm & Haas Co, 105-43-57; D Brown, Munsingwear, Inc, 100-42-58.

Low net, Flight III—J Brown, Morgan Dyeing & Bleaching Co, 116-60-56; R Blank, National Aniline Div, 111-54-57; B Gale, Chicago Printed String Co, 106-48-58.

Low net, Flight IV—J D Colquitt, Koppers Co, 125-75-50; W C Hilderstein, Art Textile Corp, 122-63-59; R Doebler, General Aniline & Film Corp, 140-81-59.

Closest to pin—A E Patton, Yale Woolen Mills.

Longest ball—R Powers, Koppers Co.

In horseshoe pitching, Bernard Isenogle, Aurora Bleachery, won the singles event. The team of Ed Hoffman, Western Piece Dyers & Finishers, and his guest, Louis Banlong, won the doubles event.

The team of Emil Gruetzmacher, Lacon Woolen Mills, and Elmer Scharf, Sonneborn Chemical & Refining Corp, took top honors in shuffleboard.

Cochairmen of the Outing were Walter H Sites, Ciba Co, Inc, and Francis J Connolly, Morgan Dyeing & Bleaching Co.

Employment Register

This column is open for two insertions per year, per member, without charge. Blanks may be obtained from, and filed with, the secretary of the Association, Post Office Box 28, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the secretary.

60-9

Education: Drexel Inst of Technology, diploma in scientific structural engineering; Pennsylvania State Univ extension course, two semesters (150 class hours), certificate in textile chemistry—testing and inspection.

Experience: Supt skein dyeing, dyer foreman (piece dyeing).

Position desired: Supt of dyeing, skein or piece.

Location: Eastern U S preferred; other domestic or foreign acceptable.

Age: 53; married; two dependents; references.

7-11, 7-25

60-10

Education: B S and M S (chemist).

Experience: Research chemist.

Position desired: Research & development.

Location: New England or California preferred; North, Northeast or Southwest acceptable.

Age: 45; married; three dependents; references; complete resume on request.

7-11, 7-25

60-11

Education: AB, Harvard, majoring in chemistry.

Experience: Chemist, consultant, general manager and new product analyst.

Position desired: Product or process development as director.

Location: No preference.

Age: 54; married, four dependents; reference upon request.

7-25, 8-8

JUNE 23 - 29, 1960

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Earl B Lindquist—Vice president, Robinson Thread Co, Worcester, Mass. Sponsors: W W Pennock, C E Sheehan.

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AATCC strives to maintain a high scientific and professional standard for papers. Authors must make every effort to avoid the use of trade names, commercial products or process names wherever such use may be construed as advertising. Wherever possible, scientific nomenclature must be employed, eg, *Colour Index* designations for dyestuffs and pigments in place of the trade names. It is recognized that in some instances trade names are necessary to avoid lengthy description. Certain trade names have been so widely used as to become generic and these normally are permissable. Further, some technical papers may involve the presentation of a new product or process wherein trade name reference is obligatory.

Giving due consideration to such valid exceptions, it is incumbent upon the author to maintain the proper scientific attitude, avoiding any expressions or devices aimed at promoting a particular product or process.

Questionable papers are to be referred to the chairman of the Publications Committee, who will submit them to an editorial board which would be appointed as needed. The Board would report to the Publications Committee, which would have the final voice in accepting or rejecting a paper.

MANUSCRIPTS — Manuscripts shall be typewritten double-spaced with approximately one-inch margins on 8.5x11-inch white paper. In addition to the *original*, at least one carbon copy is required. Pages are to be numbered consecutively with Arabic numerals, and each page after the first shall carry the authorship at the very top. Tables and figures shall also be numbered consecutively, the tables with headings containing Roman numerals as TABLE I, TABLE II, etc, and the figures with Arabic numerals as Figure 1, Figure 2, etc, appearing *below* the figures. The names of the authors and their laboratories or business connections should appear below the title of the paper.

LITERARY STYLE AND FORM OF PRESENTATION—In the writing of papers, authors are requested to observe a trenchant, simple style of writing directed to textile chemists and colorists with at least an elementary knowledge of chemistry, physics, mathematics, engineering, textile processes and textile machinery.

In the organization of the material, there should be one or more introductory paragraphs setting forth the occasion, significance and main objectives of the paper and of the method of attack. This should be followed by the body of the presentation, either with discussions interspersed throughout this portion or with a collected section marked "DISCUSSION" after the main body of the paper. Finally, there may be a brief section at the end entitled "SUMMARY" or "CONCLUSIONS."

Center and side headings make for easier reading. Center headings should be employed sparingly and generally will include only very important section headings, such as "INTRODUCTION," "EXPERIMENTAL," "DISCUSSION," "CONCLUSIONS," "SUMMARY," and "REFERENCES." Side headings (see sixth paragraph of this *Notice* for an example) shall be indented and run into the text to which they apply, and shall be separated from the paragraph by a dash. The publisher will print center headings in bold-face capitals and side headings in capitals.

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Abstracts———

(*continued from page 26*)

waste, eg, by extending the principle of counter-flow washing and using the final rinse water for new dyebaths; by using mercerized wash waters for kier boiling, etc; and by caustic soda recovery.

2) By modifying the mill processes, eg, by reuse of spent sulfur dyebaths; substituting carboxymethylcellulose in place of starch for warp sizing (the former has little effect on BOD when discharged into the stream); and replacing soap with synthetic detergents in some operations. The waste from the mill can be combined with sewage from the mill community to advantage.

3) By separating the wastes, eg, by treating the desizing and scouring wastes separately.

4) By building an aeration system, in which the waste is collected in lagoons and air is pumped through it, thus providing oxygen for aerobic bacteria and reducing the BOD materially.

5) By using the Bisorption system, a modification of the activated sludge system of waste disposal. In this method, compressed air or mechanical mixing keeps the sludge (supplied with aerobic bacteria) well agitated. This gives a clear effluent and the BOD is reduced up to 95 percent.

All of these processes are described in much detail. The author also provides tables giving analyses of typical mill effluents and the cost of treating the effluents by chemical precipitation. He refers to seven important publications on waste treatments.

●

Antistatic Agents in the Textile Industry

Henshall, A E, *Can Textile J 77*, 43-5, Feb 19, 1960

This paper deals with the static electrification of textile fibers and various methods of controlling it, particularly on the hydrophobic fibers. Five methods of control are described.

Maintenance of High Humidities. High atmospheric humidities increase the regain of the fiber and thus lower its electrical resistance, so that electric charges are readily conducted away. For many textile operations, however, the high humidity necessary to eliminate static may be difficult of attainment or be unsuitable for the particular process involved.

Use of External Conductors. Grounded bars, provided with sharp points and placed in close proximity to the fibers, will promote gaseous discharge from the fiber to the points. Fine wires stretched across the surface of a fabric will also serve the same purpose. This method will limit the charge on a fiber but cannot eliminate it completely.

Ionization of the Surrounding Air. If the air surrounding the textile can be ionized, the ions will pass from the air to the fiber to neutralize those already on it. This may be done in two ways:

1) By employing radioactive substances emitting alpha- and beta-rays. This method is subject to operator hazard.

2) By using electric static eliminators. These are expensive and constitute a potential fire hazard.

Antistatic Agents or Dressings. These offer the simplest and most economical method of controlling static electricity in the textile industry. Certain classes of substances exert a pronounced antistatic effect when applied to textile fibers. Of these compounds the so-called "surface-active agents" have been found to be the most generally useful.

Surface-active agents contain a hydrophobic chain attached to a hydrophilic end-group. They apparently function as antistatic agents largely because the hydrophilic groups attract moisture from the atmosphere on to the surface of the fabric and thus lower its electrical resistance.

The author gives typical examples of suitable antistatic agents for polyamide, polyester and acrylic fibers and acetate rayon, and describes their application. He points out that the addition of an antistatic agent must always be made in the *final* wet process; also that the products described are all nondurable and are readily removed by a mild scour. There is need of a suitable *durable* antistatic agent, he says, both for apparel and for industrial applications.

●

Du Pont Thermosol Dyeing Process

Anon, *Dyes Chem Tech Bull (du Pont) 16*, 37-51, April, 1960

The Du Pont Thermosol Dyeing Process is a continuous procedure in which dry heat is used to develop dyes on textiles. Its most important use to date has been in the application of disperse dyes to Dacron polyester fiber, although it can be used in applying many types of dyes to a wide variety of fibers. It is now being used to a considerable extent in processing blends of Dacron and cotton.

Dyeing by the Thermosol process is a relatively simple procedure in which the fabric to be dyed is padded with a solution or dispersion of the dye, dried, and finally subjected to a heat treatment at temperatures ranging from 390° to 425°F for 45 to 90 seconds. Under the influence of dry heat the padded dye penetrates rapidly and completely into the fiber.

It is pointed out that the fabric to be dyed must be absolutely clean and must wet out instantaneously and uniformly to assure adequate absorption at the padder. A suitable preparation procedure for blends of cotton/Dacron is described. Full details are given for carrying out the padding, drying and heat treatment.

Disperse dyes are the most important class of dyes applied to Dacron by the Thermosol process. Only those dyes should be used which exhibit minimum vaporization in the Thermosol unit. Generally, about 75 to 90% of the originally padded dye is retained by the Dacron in a blend fabric at the end of the dyeing process.

Selected vat pigments can also be applied to Dacron by the Thermosol method. A full 90 seconds at 410° to 425°F is required in most cases to achieve optimum dye fixation. Vat pigments offer an advantage in that only one padding operation is required if the same dye produces a fairly good union on both the Dacron and cotton in a blend. In this operation a portion of the vat dye is fixed on the Dacron and the remaining portion is then fixed on the cotton by conventional batch or continuous procedures.

The continuous coloration of blends of Dacron and cotton is accomplished with disperse dyes for the Dacron and vat, sulfur, naphthol, fiber-reactive or direct dyes for the cellulosic fiber. In the production of medium to heavy shades it is necessary to dye both the Dacron and the cotton in the blend. The most suitable procedure so far has been to apply the disperse dyes to the Dacron by the Thermosol process and then to dye the cotton by conventional procedures.

For light and medium shades disperse and vat dyes can be padded together from the same bath and the fabric dried and subjected to the Thermosol procedure. The advantage is that only one padding operation is required for both Dacron and cotton. However, shade control can be a problem, since some of the vat dye will be fixed on the Dacron.

The Thermosol process can also be used for dyeing blends of Dacron and wool.

The Solubility of Wool Dyes—Its Assessment and Practical Significance

Beal, W, *J Soc Dyers Col 76*, 78-83, Feb, 1960

The author refers to several changes which have taken place in the dyeing industry in recent years. First, dyeing machinery manufacturers have gradually developed more and more machines which pump dye liquor through the goods instead of circulating the goods through the liquor. Second, the liquor ratio in the dyebath, formerly as high as 50:1 in dyeing loose wool, has been reduced to 10:1 or 20:1 in top dyeing. Third, to improve the fastness to wet processing, new dyes of the milling or Polar type have been developed which have much larger molecules than the level-dyeing acid dyes. This increase in size reduces the solubility in water.

One consequence of these three trends is that an ever-increasing number of dyeing faults can be attributed to the use of dyes of insufficient aqueous solubility. Many of the dyes now used are less soluble than those previously employed, while their concentration in the dyebath is higher, owing to the shorter liquor ratio. In circulating-liquor machines the material being dyed, eg, cheeses or tops, acts as a filter for any dye which is not in solution.

The solubility figures given by most dye manufacturers for their products, usually based on 90-100°C, do not tell the dyer what to expect when dyeing is started, usually at lower temperatures and in presence of acids and electrolytes.

What is required is a test which will provide solubility data that take into account:

1) The amount of dye required to produce the shade,
2) The temperature at which dyeing is started,
3) The method by which the dyebath is prepared,
4) The hardness of the water or the softening used,
5) The acid and other additions made to the dyebath.

The author describes a new method of testing dye solubility which was finally adopted and which involves dissolving the dye in boiling water, cooling to various temperatures (40°, 60°, 80°C, etc), adding the necessary dyeing assistants, and filtering through bleached unmercerized cotton cloth. He considers that these conditions are as severe as any likely to be encountered in practice. He hopes that the information given by this test will enable a dyer to predict where faults are likely to occur, and so avoid them by choosing a more satisfactory dyeing method.

The author points out that, while the solubility of a dye can often be improved by adding an auxiliary product, many of the new dyeing techniques depend on the use of a compound, one effect of which is to reduce the solubility of the dye in the bath.

Nine references to the literature are cited.

•

Rovana—Dow's New Saran Micro-tape

Abernethy, N W, Papers AATT, *Modern Textiles 41*, 99-102, May, 1960

Rovana, produced by Dow Chemical Co, is basically a thin slit film of vinylidene chloride copolymer, which is folded into a continuous "micro-tape" or ribbon and can be woven directly into fabrics. It belongs to the Saran family, although it is physically and chemically different from Saran filament.

Fabrics can be produced from Rovana that are very resistant to tearing because of the flat geometry of the yarn. This simply permits a broad surface of one yarn to rest against a broad surface of another yarn, thereby lending abnormal support within the fabric structure. Lightweight fabrics of Rovana have been produced that have three to four times the tear strength of comparable cotton fabrics using yarns of approximately the same tenacity and denier.

Besides having tear resistance, Rovana is very resistant to chemical attack, is nonflammable, unaffected by moisture, rot resistant, and weather resistant.

Rovan micro-tape is a thermoplastic material having a rather broad softening range, but lacks what is commonly considered a melting point. Upon the application of heat and pressure the fiber can be compressed and shaped. When smooth-surfaced fabrics of Rovana are run through embossing rolls, the embossed design is transferred to the fabric, and the compressed areas become deeper in shade, producing two-tone effects.

Calendering fabrics of Rovana imparts higher abrasion resistance, improved surface appearance and uniformity, better fabric closure, a more supple hand, and increased resistance to soiling.

Rovana fabrics can be joined by heat sealing, to produce seams that are stronger than thread-sewn seams. When the fabrics are cut with heat, the cut edge is sealed and will be resistant to fraying.

Conventional dyeing techniques are not recommended for Rovana; however, the micro-tape is offered in a wide range of pigmented or solution-dyed colors which offer excellent fastness to washing, drycleaning and crocking. At present there are 12 solution-dyed colors, plus natural. The lack of dyeability of this new product can be utilized to produce union shades and tone-on-tone and heather effects.

The author suggests a variety of end-uses for Rovana, including draperies, luggage, upholstery, work clothing, and automobile seat covers.

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The Pad-Roll Dyeing System. A Summary of Experience.

Kern, R, *J Soc Dyers Col 76*. 173-8, Mar, 1960

The Pad-Roll machine, manufactured by A/B Svetema of Gothenburg, Sweden, is no longer a new development. The first unit was installed some five years ago and there are now 60 or more in operation in various parts of the world.

The machine consists of three components—the pad and the infrared heating zone, both fixed units, and the "dyeing-in" chamber or chambers which are movable and exchangeable. Complete details of the machine have already been given (for a detailed description of the Pad-Roll system, see *Am Dyestuff Reptr 49*, #9, 29-32, 1960). The purpose of the author is to describe practical experience in works and laboratory of the use of this dyeing system with various types of fibers.

Before dyeing, the fabric (cotton or rayon) must be thoroughly prepared by desizing and scouring, followed by bleaching when necessary, in order to give the goods the highest possible absorptive capacity. Wherever possible, this pretreatment should be carried out in the open width. The cloth is then dried, also in open width, under minimum tension. Over-drying must be avoided. In the interval between drying and padding, the goods should be protected from inadvertent water spotting. All the cloth to be dyed should be pretreated and dried at the same time.

In padding, an attempt must be made to work with the smallest possible volume of liquor, in order to obtain a rapid rate of bath renewal and to minimize affinity differences between different dyes used in combination. Wetting agents should not be used, to avoid foaming. A small addition of Glauber's salt or sodium pyrophosphate has a beneficial effect on fixation.

At high dye concentrations it is

advisable to pad at the highest permissible temperature in order to keep the dye in solution and to heat the goods. The dyes for combination shades should have similar affinities at the padding temperature.

After passing through the tension adjuster the padded goods enter the heating zone, where both the dye liquor and the cloth are heated to a temperature as near as possible to that of the dyeing-in chamber. This is of the utmost importance.

The dyeing-in chamber is equipped with an electrical heating device and a steam inlet valve, both of which are automatically controlled, and a wet- and dry-bulb thermometer, which regulates both the heating and the steam. The dyeing-in time depends largely on the depth of the dyeing and the type of fabric. It varies from three to eight hours. During dyeing-in, the cloth is rotated slowly.

After fixation, light and medium shades do not usually require rinsing, but heavy shades should be washed.

Athough originally designed for dyeing cellulosic fibers, the Pad-Roll system has latterly been used with success for polyamide, polyester and acetate rayon cloths. Special instructions are given for dyeing these fabrics. Because of their hydrophobic character these materials are padded in presence of thickening agents, the most suitable being alginates and crystal (industrial) gum.

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The Chemistry and Application of Rug-backing Compounds

Brawner, G, *Textile World* 110, #1, 79, 82, 85; #3, 103, 106-7; #4, 69-71; #5, 70-2, 76 (1960).

Backing compounds now in use on rugs and carpeting are based on both natural and synthetic latices. Natural rubber was the first latex to be used. The latices are sold in the form of an emulsion that is stabilized with soap or a similar compound.

Uncompounded, natural latex will give a film of plastic rubber that becomes tacky and discolors with age. It is only by vulcanization that a usable, resistant, cured product can be obtained. Natural latex is the most widely used carpet backing. It gives a firm hand and strong tuft lock, and can be loaded with fillers or extensions to a greater extent than any other latex.

When synthetic latex was first produced, its properties were compared with those of natural latex as the most desirable standard available. Good control in manufacturing has made it possible to produce latices with a particle size below one micron, far smaller than the particles of natural latex, and has also enabled producers to place different charges around the particles themselves, either cationic (positive), anionic (negative), or nonionic (neutral). Often these charges can be utilized in obtaining better penetration of the latex. Most of the latices are stabilized in a nonionic or anionic system.

GRS latices are made from butadiene and styrene in various proportions, GRS 2000 with 46% styrene and 54% butadiene, and GRS 2105 with only 26% styrene. They are widely used for rug backing. Of the two, GRS 2105 more closely approaches the properties of natural rubber.

Nitrile latex is a polymerized butadiene/acrylonitrile. It furnishes a coating that is very resistant to oil and grease, but is sensitive to u v light and heat effects.

Styrene latices are also made from styrene and butadiene but with a greater proportion of styrene. They are used in backing compounds to stiffen the coating.

Polyvinyl chloride latex is used for the same purpose as the styrene latices, but only in compounds made with nitrile latex.

Backing compounds are formulated to meet a specific end use. Some of the factors that have to be considered are certain qualities of hand, such as flexibility, resilience, hardness, weight, surface appearance, and skid resistance.

The author gives full directions for assembling the various ingredients of the backing compounds and for applying the backing to carpetings (by spraying, roller-coating, or by means of a knife blade or doctor). The drying and curing operations are also described in much detail.

The author points out that every backing compound achieves a certain amount of mechanical adhesion to the substrate, but the factor that makes a compound superior in fiber adhesion is actual chemical linkage to the fiber.

Rug-backing compounds may be applied before or after dyeing. A "precoat" has to withstand bleaching, dyeing and laundering after it is applied. Such compounds are used on tufted bath mats and scatter rugs. A typical precoat formulation, containing both natural latex and GRS 2105, is given.

Compounds applied to rugs after dyeing are generally lower in cost than precoats. Several formulations of typical aftercoats are listed. GRS latex is often used as the base because of its low cost.

Considerable sales appeal is added to carpeting when a closely woven jute fabric is laminated to the back. In addition, the dimensional stability of the carpet is increased. The jute is laminated with an adhesive coating. A typical one, using natural latex, is described.

Finally, the author refers to the use of latex foam rubber, which he says is rapidly becoming the most popular type of underlay produced. A combination of natural latex and GRS is most commonly used.

•

Cross-linked Cellulosic Fibers

Anon, *Textile Recorder* 77, 75-6, May, 1960

A new range of cross-linked cellulosic fibers has been introduced by Courtaulds (Alabama) Inc. As a result of chemical modifications, these fibers, which have been named Corval and Topel, have properties differing from those of other cellulosic fibers. Both Corval and Topel are said to be in limited commercial production.

Corval resembles other cellulosic fibers in many ways, but has some advantages over normal viscose rayon, eg, lower water absorption and swelling and higher wet strength. It has a soft, bulky, somewhat wool-like hand. It has improved dimensional stability to laundering, and blends well with synthetic fibers and wool.

Topel has properties distinctly different from those of viscose rayon, eg, water absorption and swelling properties approaching those of cotton, dry strength similar to that of medium tenacity viscose and a slightly higher wet strength. It has good inherent dimensional stability to laundering, and blends well with nylon and cotton. The low swelling properties of Topel permit yarns from it to be beamed and package-dyed. Fabrics produced from it are said to have a soft and "luxurious" hand.

Both Corval and Topel are insoluble in cuprammonium hydroxide solution, and have greater affinity for acid dyes than viscose rayon. Both fibers may be mercerized, and are similar to the other cellulosics in resistance to acids, bleaching, and common solvents.

All dyes commonly used on cellulosic fibers may be used on Corval and Topel. The rate of dye exhaustion is higher than with viscose, and is best controlled by regulating the dyebath temperature.

JULY JUNKET
1960

Inter Alia—Inter Nos

P J WOOD

WRITING

"Fuellfederhalter, Bleistifte und Kugelschreiber" is the title of a very interesting article in the May number of Die BASF, the house-organ of the Badische Anilin-& Soda Fabrik A G. This gorgeously illustrated journal reaches us every month courtesy of Leon Moody and his associates at the Putnam Chemical Co.

Translated, these words mean "Fountain Pens, Lead Pencils and Ball Pens".

The article by Hans Rudolf Jacobi reveals that the first practicable fountain pen was invented in the 16th century. Reference is made to it by Pastor Johann Mathesius, a preacher in Joachimsthal, in one of his sermons. In a book with the title "Mathematical and Philosophical Hours of Delight", written by an Altdorf University professor named Daniel Schwenter, is shown a diagram of "a pen which holds ink".

These early inventions did not set the world on fire, evidently, but men were thinking constantly of improving these first essays to do away with ink wells and the necessity of having to dip the pen every once in a while, so that in the nineteenth century several people did bring out a pen that would write and that should not leak, although some of them did.

One of the first we remember was the Swan. It did a good job--mostly--but it worked well with some inks and not so well with others. It was not until the chemist came into the picture and devised an ink that would fulfil the requirements that the fountain pen could be said to be a success.

Not too many years ago the first ball-pen was put on the market. It seems to have been prematurely introduced, as it had two starts. The second start was the best. Here again it required the brain and hand of the chemist to produce an ink that would supply all those qualities necessary to successful writing with the ball pen. Now one can buy a ball-pen, of a sort, for as little as five or 10 cents.

From this article we have gained an idea of the anatomy of the ball pen that we never had before; the explanation is clear and the illustrations really illustrate.

ADHERENTS, AIDERS & ABETTORS, ADMONISHERS

The same day that we espied the sad news of the passing of our old friend and classmate, Croyden Meredith Whittaker, Bill Penn, the genial general manager of dyeing at Courtauld's plant in Coventry, sent us a letter making the same announcement (Sic transit gloria mundi). Dr Whittaker had led an unusually active life, a large part of which was devoted to unselfish service to his fellow scientists in the field of textile coloring. Bill also corrected us on our idea that Gordon W Bednall, the talented editor of the Dyer, was the "Argus" who wrote several articles on the lives and accomplishments of many Europeans, known to most of us. This is what he said: "Although he has had a good innings (speaking of C M W), we are all distressed at the passing of the 'grand old man' of the dye-making and using industries in this country." Then he continues. . ."In your notes in the 18th April issue of the A D R you made a mistake. The author of Dr Whittaker's 'Portrait in Colour' was an old Leeds contemporary of yours, viz, Syd Meadows, recently retired from Sandoz Products Ltd, Bradford. He has been responsible for all the 'Portraits' appearing in the Dyer and for the series 'Brief Encounter' in the Hosiery Trade Journal". Thanks Bill; sorry Syd.

A short but merry note from "Beek" Schaeffer, vice pres of Stonecutter Mills, bringing back to mind those 13 happy but busy months we spent in Spindale, NC, nearly a 1/4-century ago.

An up-to-date list of the surfactants in the Union Carbide Chemicals Co line, all duly marked with the Sisley classification symbols to be included in the forthcoming Vol 2 of "Encyclopedia of Surface-Active Agents", due to go to press in the fall of this year. Thanks to E P Fisler; this will serve as a note to others interested to do likewise.

Dropt in to see Leonard Little the other day and found him just as "peppy" as ever and well disposed to consider the state of the nation and other matters of importance. He has well deserved the honor that is to come to him by his activities covering many years. Too bad he is still a bit lame, but we have hopes that he will soon be in shape to turn handsprings again as in the days of yore.

ECHO FROM THE PAST

Looking through an old number of "The Crucible", a quarterly house organ published by Hagstoz, the precious metals recoverers of Philadelphia, brought back the memories of Walter Davenport's amusing and instructive column in Collier's, in which he describes a worry-saving system adopted by a North Carolina storekeeper who put up this sign in his shop:

> "Try our Easy Payment Plan--100% down--No Future Worries About Monthly Payments"

There is no stern notice on this bright little journal regarding copyright, so we feel free to add another gem from it, with thanks to Messrs T B Hagstoz & Son; this one is attributed to Charles E Wilson, formerly a cabinet officer in our government. If we had to make up a heading for it, we would swipe one that used to be used by the Terminal Barber Shops in New York, namely, WHERE THE PROMISE IS PERFORMED. Here it is. . ."A Company's behavior must be as good as its literature claims. As one expert warns, 'It is of little avail to have the factory walls decorated with portraits of Abraham Lincoln if Ivan the Terrible is walking up and down the aisles'."

OFF TO THE RACES

The following courageous letter, which appeared in Betchel's Bulletin, was sent to us by our favorite Pennsylvania Dutchman, a native of Columbia, Pa, Carl Brubaker, who, in spite of his broken arm, still remembers that we have a spot of writing to do, once in a while. Thanks Capt.

OFF TO THE RACES

"On April 26, the voters of Philadelphia overwhelmingly approved Licensed Gambling. More people voted for gambling than voted for candidates to be nominated for public offices; They voted for 'the big gambling joint--with bright lights, expensive food and all the other trimmings to persuade the suckers to shell out'. (Wilkes-Barre, Pa, Sunday Independent, April 17, 1960).

"The voters were duped by the loose talk of the proponents for gambling who said that the state's take in taxes would be so big that general taxation would be eased. This simply is not true. The amount of revenue produced will be infinitesimal compared to the ever-increasing needs of our spendthrift government. It is probable that legalized gambling will create a new need for raising taxes. The expense of maintaining and policing legalized gambling requires a considerable amount of money. There is a likelihood that some money will be required to care for those who become destitute because of their insatiable desire to gamble.

"No, we are not off to the races' but we are off the moral standard that is good for our Commonwealth, whose motto is 'Virtue, Liberty and Independence'. Can there be any virtue in gambling?" - F Clarke Bechtel.

WEIGHTS AND MEASURES

"Mass und Vermessenheit des Menschen" is the title of another article in Die BASF by Otto Friedrich Bollnow, professor of philosophy at Tuebingen University.

"Proportion and Presumption of Man" is probably as near as we can translate this title. It fits the subject matter of the thesis better than any other "doing into English" that we can think of.

It demonstrates the value of a sense of proportion and deplores Vermessenheit, which may be translated "presumption", defined in "Britannica World Language Dictionary" as "1) Blind or overweening confidence or self assertion, 2) A passing beyond the ordinary bounds of good breeding. . ."; or it may be anglicized by the word "presumptuousness" indicating, according to the same authority, "undue confidence or boldness; audacity; arrogance; insolence; presuming unduly, as upon success or the forbearance of others".

The learned professor points out that a back-look into history reveals that there have been times when man seems to have been aware of his limits, and other times in which he exhibited great immoderation, regarding which he remarks that "immoderation never enjoyed such unrestricted sway as nowadays".

Comparing the matter of measurement and human life, Dr Bollnow, taking the German word "Maessigkeit" (moderation) as the norm, considers three German words as expressing deviation from this "correct measure" - they are Unmaessigkeit (excess), Masslosigkeit (immoderation), and Vermessenheit (presumption).

By a comparison of the sense of these three important words, the writer arrives at the conclusion that the highest attainment for which man should strive is the establishment of a right relationship between reason and the irrational forces of life.

The illustrations relating to the principles of proportion and measurement of time, length, area and capacity, are beautiful - a picture of a cathedral that was never built, showing the glorious proportions of the design - the vaulted ceiling of the parish church of St Michael in Schwaebisch Hall (15th century); a gorgeously engraved pedometer (of all things) dating back to the end of the 16th century; pictures of two handsome vessels known as the measuring basin for the town of Ulm, and the tithe basin used for collecting the levies on farmers made by the church or the nobility, or both.

When we spent a summer with BASF, the doctors in the Indigo Department would give us sentences from time to time, in order to improve our pronunciation. Mention of the town of Ulm reminds us of one of these; it went: "In Ulm, um Ulm und um Ulm herum"; try it out on your larynx.---QEF.

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Keen Ear for Consumer Needs A Must for Textile Progress

Basic research, product development, and application research have long been recognized as the backbone of textile progress, and Cyanamid devotes unstinted time, money, facilities and personnel to a continuing research program. In tune with the industry's expanding requirements, however, a fourth area of research is receiving increasing emphasis: Market Research. This involves not merely the *statistics* of markets, but the present and future needs and wants of *human beings*. It means close study of various "ways of life", close cooperation with stylists, designers, manufacturers and merchants who serve the consumer. No one, of course, can blueprint precise future developments – but with ears to the ground and eyes to the future, producers can come close to the goal of providing the public with products and processes which add ease and pleasure to living, and profit to the industry.

Quick Tip

To distinguish between cellulose acetate and cellulose triacetate (Arnel):

Dye a sample with 0.2% Basic Blue No. 1-CI42025 and 0.5% Acetic Acid.

Raise quickly to the boil and dye 2 to 5 minutes. Cellulose acetate is dyed a brilliant turquoise blue and cellulose triacetate is stained a very light blue.

New Calcozine Acrylic Dyes Simplify Procedures, Get Brilliant Results

With the introduction of Cyanamid's new line of cationic dyes for acrylic and modacrylic fibers, successful dyeing of these fibers becomes a routine, dependable process–and marks another great advance for the industry.

Calcozine Acrylic Dyes need no retarding agents, nor the delicate care and supervision essential to many cationic dyes. The new Calcozines require only common salt and acetic acid for even exhaust and level dyeings.

A further practical advantage is that Calcozine Acrylic Dyes can be readily stripped back by boiling with salt. This enables dyers to regulate the total depth of shade, which sometimes becomes excessive with the adds made to reach a desired cast.

Calcozine Dyes are brilliant in shade and build up exceptionally well to heavier shades of great richness and bloom. Fastness characteristics are excellent.

The new dyes are applicable to such fibers as Orlon 42, Acrilan 16, and Verel, by the simplest salt and acetic acid dyeing procedure. Creslan, Dacron 64, and Acrilan 3400 can also be dyed, with suitable dyeing assistants or pretreatment.

Extensive use of Calcozine Acrylic Dyes in blends is anticipated, since they show little tendency to stain cellulosic and animal fibers. Cross-dye and union effects are under positive control and easily accomplished.

Cyanamid Technical Service is ready to help introduce these advanced dyes and their method of application for commercial production.

Cyanatex Dyeing Assistant EM Speeds Polyester Dyeing, Cuts Costs, Brightens Shades

Among the most useful items in dyeing polyesters is the uncommonly fine product known as Cyanatex Dyeing Assistant EM. Unlike most of the solid carriers, Cyanatex EM does not reduce the fastness of dyeings, and therefore eliminates the need for a severe afterscour to remove the carrier. It also helps produce greater color values from dyes; shortens dyeing cycles, thus saving personnel, steam, and power costs; speeds diffusion of dye into the fiber at below-the-boil temperatures; and of course contributes to brighter, more attractive shades.

Carriers are used as dye-bath additives to increase the rate of dyeing and to promote exhaustion of the dye bath. Just how they act is not completely known, but Microdyeoscope experiments show that these compounds may act in at least one of two ways: as dye-*solvents* or as dye-*precipitants*. When the carrier acts as a solvent–it holds the (disperse) dye in solution and, when present in excess of its water solubility, colored globules form and attach themselves to the fiber. When the carrier acts as a precipitant–the dye-carrier complex accumulates around the fiber or on the fabric, and then gradually dissolves with continued time at the boil.

If the carrier-dye solution or the carrier-dye precipitate (whichever is formed) is comparatively stable, it will compete with the fiber for the dye and may slow down the rate of dye absorption.

When a high concentration of carrier is used, a considerable portion separates from the water phase and globules containing color attach themselves to the surface of the fibers. Surprisingly, this does not cause more rapid dyeing at the point of globule-fiber content, as might be expected. Areas of fiber covered by colored globules for one to two hours at the boil are not more deeply dyed than adjacent areas free of globules.

It appears that the "rate" of dyeing is accelerated by the diffusion of a carrier into the fiber. Also, it is known that the carrier is absorbed: Fibers pre-treated with carrier, then rinsed, and subsequently dyed without further addition of carrier to the bath, are more deeply colored than the control dyeing made without any carrier at all. The latter may be only 50% as strong.

The notably superior quality of Cyanatex Dyeing Assistant EM, product of Cyanamid's continuous research and development, contributes many "plus" values during production and in the completed job. For sample–contact your Cyanamid Dyes representative.

News of the Trade

International Salt Dedicates New Administrative Headquarters

International Salt Co, manufacturer of Sterling salt products, dedicated its new $2 million administrative headquarters at Clarks Summit, Pa, on June 23. Howard T Engstrom, vice president and director of Univac Scientific Marketing, Remington Rand Division of Sperry Rand Corp, was principal speaker at the formal dedication ceremony attended by 900 invited guests. Dr Engstrom is one of the creators of the Univac scientific electronic computer.

Tours of the office building and a buffet luncheon preceded the dedication ceremony. Open house for the general public was held on Saturday, June 25 and Sunday, June 26.

The new headquarters is set on a 184-acre country site seven miles from Scranton Pa, home of the company since its founding in 1901. Construction of the building, which houses the company's 200 top officials and administrative personnel, was begun early in 1958 and was completed last November.

The building reportedly contains 93,000 square feet of floor space and has a central hallway which is almost 500 feet long. The central wing is two stories high, with the remainder of the building being one story with a basement under most of it.

International Salt Company, reportedly the largest salt producer in the United States, manufactures more than 80 Sterling salt products. The company is presently constructing an $11,000,000 rock salt mine at Cleveland, O. International Salt operates other rock salt mines at Avery Island, La; Retsof, NY; and Detroit, Mich. The company's evaporated salt refineries are located at Avery Island; Ludlowville, NY and Watkins Glen, NY.

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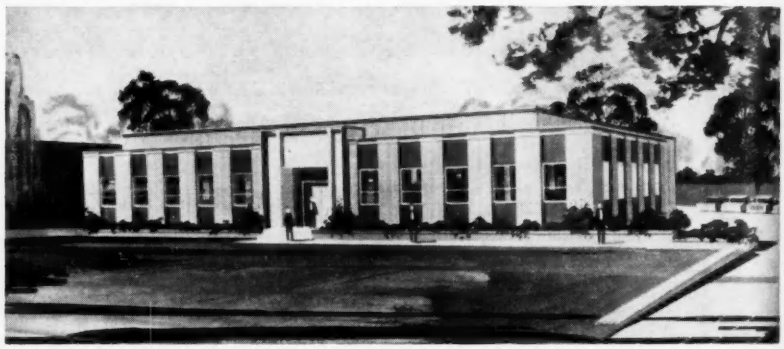
Toms River-Cincinnati Changes Name

The Toms River-Cincinnati Chemical Corp announced a change in the name of the company to the Toms River Chemical Corp on July 1.

This action has followed centralization of the company's chemical manufacturing facilities in Toms River, NJ, by the transfer of production from the plants formerly operated in Cincinnati, O.



Drawing of Foxboro Co's new regional sales headquarters and instrument shop, Chamblee, Ga

New Southeastern Headquarters Opened by Foxboro

To meet increased instrument needs of process industries in the Southeast, The Foxboro Co has moved its seven-state sales and service headquarters to a newly constructed building at 3393 Malone Drive, Chamblee, Ga, an industrial suburb of Atlanta.

In addition to housing the industrial instrument company's regional headquarters, the new building provides offices for the staff of the Atlanta branch and a service and repair shop for the general area.

The regional office coordinates the Company's sales and service facilities in ten major southern cities. The new shop reportedly contains facilities for calibration and repair of Foxboro instruments, a warehouse stock of replacement parts and accessories, and supplies of standard instruments available for emergency shipment. Included is a training center for Foxboro regional service personnel.

The staff of twenty includes Regional Manager E W Prendergast; Regional Engineer F H Leathers; Regional Service Supervisor W G Bloodworth; Atlanta Branch Manager T A Jones; and Shop Manager M S Batchelder.

•

Metro-Atlantic to Build New Plant in SC

Metro-Atlantic, Inc, Centredale, RI, is preparing to build a modern chemical plant in Simpsonville, SC. The company has purchased twenty acres of land on the new manufacturing site on Laurens Road on the outskirts of Greenville, SC. Further details will be made known after the award of contract.

The firm was organized at Centredale in 1939 and in 1952 started manufacturing at its present Southern plant located at 1210 Poinsett Highway in Greenville.

•

Hostachem Opens Chicago Office

Hostachem Corp, Mountainside, NJ, a distributor for Farbwerke Hoechst AG, West Germany, has announced the opening of its new Chicago office in Suite 4010-17, Board of Trade Building, 141 West Jackson Boulevard. E O Rohardt has been appointed manager.

Some of the Hoechst products to be distributed throughout the Mid-West by Hostachem are intermediates, including diazos; Hoechst waxes; ferrosilicon atom; tylose and methyl cellulose; fine chemicals; plastic films, sheetings, filaments and fibers.

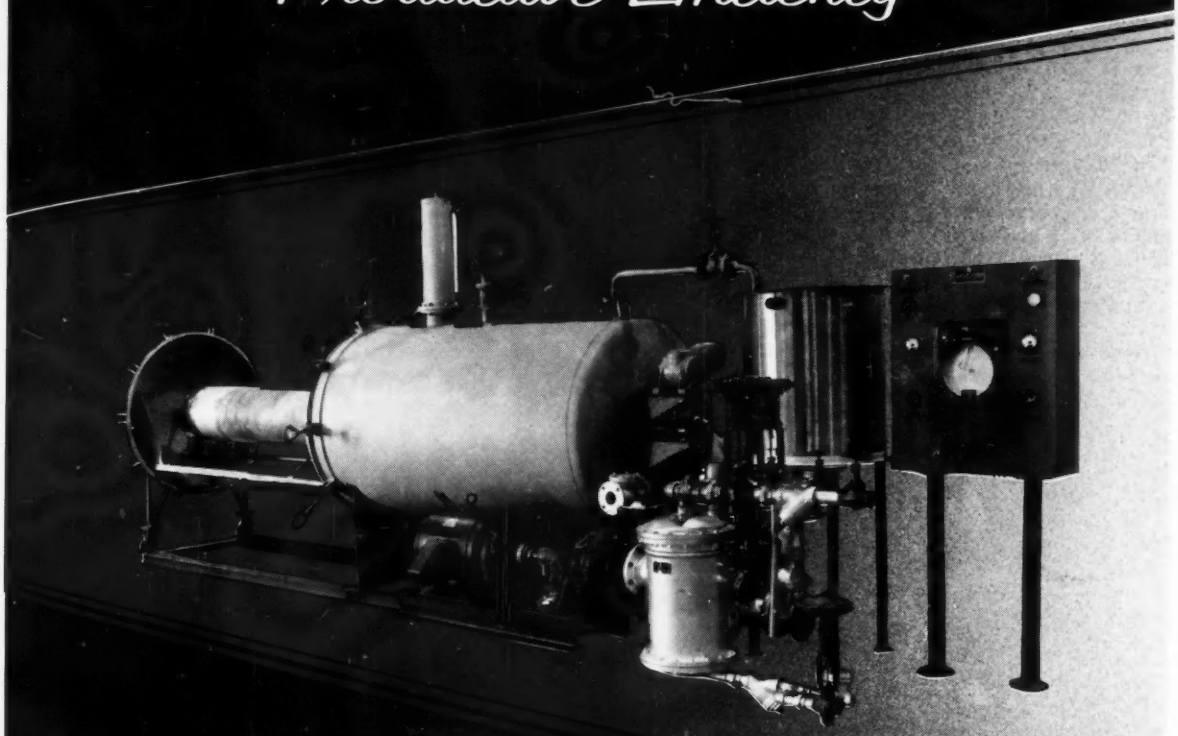
•

PTI Sponsoring Management Center

A newly developed "Advance Management Center" sponsored by the Philadelphia Textile Institute in cooperation with Harry J Woehr and Associates, Philadelphia, will present three summer seminars at the college beginning today (July 25).

The three initial courses offered will include "Executive Decisions", "Trends in Executive Compensation", and "Effective Executive Communication". All will be geared for presentation at the top-management level and each will be conducted for five days.

PROVEN
Productive Efficiency



GASTON COUNTY pressure dyeing machines for FABRICS not only cut production costs, but improve the quality of the finished product.

Fabrics made of synthetic fibers have a much greater affinity for dyestuff when the dyeing process is carried out at temperatures of 230° F to 250° F.

This method produces more level shades, better wash fastness, better resistance to crocking, and the saving in dyestuff and chemicals is sometimes as much as 50% compared to conventional dyeing in open machines at lower temperatures.

Machines are available with "one-way" or "two-way" flow as required by material to be processed.

Other features include heat exchangers for automatic heating and cooling, automatic pressure and flow controls, static pressure chambers, pressurized expansion tanks, running wash systems and automatic beam revolving devices.

Machines are custom built to individual mill requirements.

GASTON COUNTY

Gaston County Dyeing Machine Co.

WORLD'S LARGEST PRODUCERS OF PRESSURE DYEING & DRYING MACHINERY

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Construction Begun on AICC Research Lab

New textile products are among developments expected to result from the new Armour Industrial Chemical Company research laboratory, construction of which began June 2 in McCook, Ill.

Ground was broken for a one-story laboratory and a pilot plant at 47th St and Riverside Ave. Panels of glass windows will stretch across the entire front of the laboratory, which will be finished in face brick similar to that used in the Armour McCook Chemical plant.

M E Lewis, general manager of Armour Industrial Chemical, said the new laboratory and adjoining pilot plant will allow for expanded and intensified research programs designed to create new organic chemicals and improved processing techniques.

"Now that Armour and Company has decentralized its research activities," he said, "Armour Industrial Chemical Company will be responsible for product development and technical service as well as fundamental research.

"Construction of the new laboratory indicates how dependent we are on research activities. Many of our present products were unheard of just 10 years ago and we intend to develop and produce in the future still more chemicals which are unknown today.

"The new pilot will allow us to work out processing techniques for the commercial production of new chemicals. Experiments can be carried on with small quantities of materials before beginning full-scale production."

The Company's research laboratories are now at 1355 W 31st Street, Chicago. It is expected the new McCook facilities will be ready for occupancy by late fall.

Armour has been producing fat chemicals since 1910 and has operated its McCook plant since 1949. In that time the plant has tripled its production. The plant produces long-chain fat chemicals and derivatives.

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Polyvinyl Chemicals Completes Expansion

Polyvinyl Chemicals, Inc has completed an expansion program that has added 5,000 square feet to its laboratory and administrative facilities. Included in the expanded laboratory setup is a new polymer pilot plant. The Company has also completed expansion of its polymer emulsion plant capacity by 20,000,000 pounds of product per year, it is reported.

Columbia-Southern Building Ethylene Dichloride Facility

Columbia-Southern Chemical Corp recently began construction of an ethylene dichloride plant at the company's Lake Charles, La, facility. The plant reportedly will cost in excess of $1,000,000 and initial production is scheduled for September. The new unit will adjoin the firm's large chlorine and caustic soda manufacturing operation.

Production of this organic compound will mark Columbia-Southern's entry into chemicals based on ethylene. It will be the first captive use of chlorine produced at the Lake Charles location.

The process for the new plant was developed by the research and development department at Columbia-Southern's Corpus Christi operation. Extensive pilot plant testing on the new process also was completed at the Corpus Christi plant.

Columbia-Southern in April introduced price increases of $2.00 a ton on liquid chlorine; $2.50 a ton on soda ash; $2.00 a ton on high-test flake calcium chloride; and $1.00 a ton on regular flake calcium chloride.

A company spokesman pointed out that the increase was made to cover constantly increasing labor costs and higher fuel and raw materials costs. The price increases were the first made by Columbia-Southern since 1956 on chlorine and soda ash and the first since 1957 on calcium chloride.

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1959 Summary of Textile Damage Complaints Investigated by NID

No significant changes have taken place in the overall textile damage complaint picture according to the third annual report of the Textile Analysis Department of the National Institute of Drycleaning. Consumers, drycleaners and textiles each account for essentially the same ratio of damage causes as was shown in 1958. These were Consumer—38.7%; Fabric—36.7%; Drycleaner—19%; Unknown—3.4%; and Garment Construction—2.2%. Taken altogether, the data reflects a remarkably consistent pattern of complaint incidence in all categories.

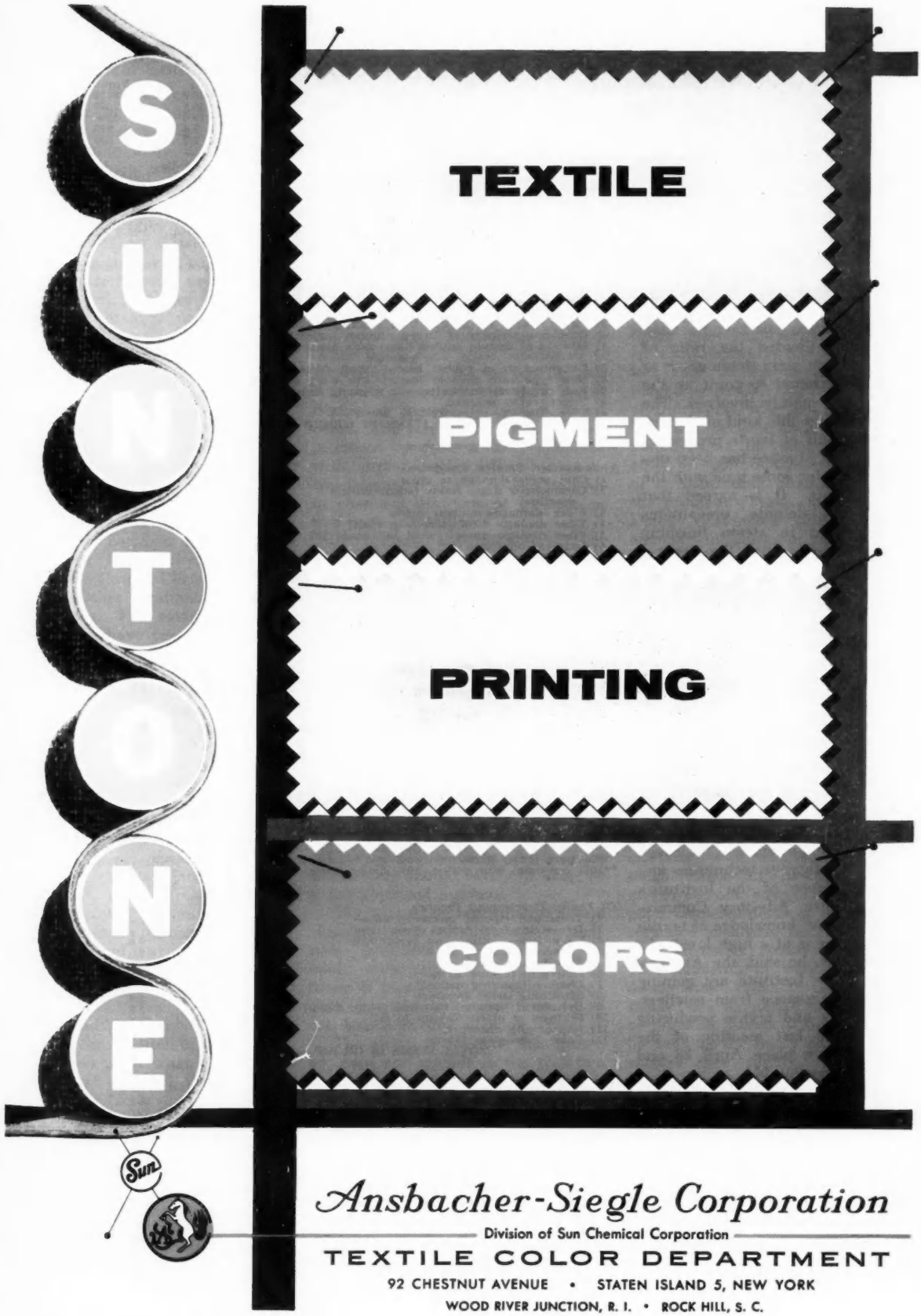
The total number of problems examined in 1959 was 21,920, an increase of 540. The volume of physical damage cases dropped slightly to 6,525, whereas dye or design damage case rose to 6,749 to just barely reverse the position of these major categories over the preceding period.

Dimensional change problems were nearly static at 1,684 cases, and only a slight increase was noted in the 4,525 stain damage problems handled. A gain of 16% in the number of finish damage cases investigated is accounted for largely by miscellaneous increases in the various damage types listed as drycleaner and fabric caused. In the former, stiffness of drycleaned, plastic-coated fabrics showed an increase, as did the number of fur-like pile and velvet distortion cases which are listed as finish problems. Chafing caused by improper spotting methods also rose in number of complaints resulting from the effects of water on water-sensitive finishes.

A new section was added to list the problems which made their first appearance in this period or which began to show a significant upturn during the year. Most of these items have been subjects of technical bulletins and special news releases. "Heat stains" on Dacron/wool blends are actually the result of fiber shrinkage in cross-dyed blends. The uncolored Dacron fibers, as a result of heat conditions present in underpressing operations, cause them to recede into the yarn and expose more of the dyed wool. The effect is a "stain" appearance which occurs in manufacture or alterations but which often escapes notice until critical examination of the garment by the consumer after drycleaning. Another interesting problem was seen in the severely matted condition of acetate quilted house coats which was traced to the use of a polyvinyl acetate bonding agent in preparation of the quilting bat. Use of this agent is not recommended by Celanese Corp. Complaints of delamination during drycleaning of a rubber coating on poplin in car coats made in Hong Kong also gained in volume during the period.

The careless use of cold wave chemicals continues to be the largest single cause of damage, followed very closely by complaints of color loss in pigment prints. The third most common cause of complaint is the deteriorating effect of sunlight on curtains and draperies causing rips and tears to occur when processed in drycleaning. A closely allied problem is the tenderizing effect of certain dyes on cotton and rayon when exposed to sunlight. The resulting formation of oxycellulose causes the fabric to become torn in the areas of the color during drycleaning.

Other causes of physical damage to fabric include the old problem of moth attack on wool. However, of



Ansbacher-Siegle Corporation

Division of Sun Chemical Corporation

TEXTILE COLOR DEPARTMENT

92 CHESTNUT AVENUE • STATEN ISLAND 5, NEW YORK

WOOD RIVER JUNCTION, R. I. • ROCK HILL, S. C.

the 512 cases of insect damage, 146 involved fabrics other than wool. Research on the vulnerability of non-wool fabrics to moth larvae attack has shown that severe damage may be inflicted on most any fabric, except glass, when protein-type stains are present during periods of storage. The fibers are ingested by the larvae in their feeding upon the stain. For this same reason wool blends are often more severely damaged than 100% wool fabrics.

Under the shrinkage classification in the Fabric Defect group, a high percentage of this item is shown to involve wool and wool/Orlon jersey garments. Chief Analyst W Clay Hardin has estimated the ratio of printed jersey to plain shade goods at 60-40, in an attempt to point up the type of jersey mainly involved. The question whether this kind of shrinkage is the result of fabric processing or faulty plant practice has been under discussion for some time with the Jersey Institute. It is agreed that certain, very definite precautions must be taken in steam finishing jersey knit goods, and the general practice among drycleaners is to guard against more absolute minimums of steaming. But the development of specific instructions on the handling of jersey in drycleaning has not been forthcoming because of difficulties encountered in defining these precautions instructionally. Until the issue is resolved, therefore, the inclusion of this problem in the Fabric Defect group is open to question. It is hoped that the problem can be given a more positive classification in the next report.

Mr Hardin advised that his department has made a number of improvements in investigative techniques under the guidance of the Institute's Textile Analysis Advisory Committee and that staff knowledge of textile damage causes is at a high level. As a consequence, he said, the Analysis Reports of the Institute are gaining increasing acceptance from retailers, manufacturers and textile producing interests. The last meeting of the Committee took place April 28 and 29 in Silver Spring, Md.

The members of the committee include: Charles W Dorn, textile consultant; Dorothy C Matthai, merchandise manager, Better Business Bureau, Inc; Charles A Seibert, former head of the Dye Properties Division of the Du Pont Company's Technical Laboratory; Mary C Whitlock, professor and head of the Textile and Clothing Department, College of Home Economics, Univ of Rhode Island.

1959 NID TEXTILE ANALYSIS STATISTICS
Includes Comparison with 1958

Total Problems

	1959	1958
	21,920	21,379

Problems Attributed to:

	Number	%	Number	%
A) Consumer Service Conditions	8477	38.7	8739	41.3
B) Fabric Defects	8055	36.7	7530	35.2
C) Faulty Drycleaning Practice	4168	19.0	3966	18.5
D) Unknown	737	3.4	615	2.7
E) Garment Construction	483	2.2	529	2.3

Types of Complaints — *Attributed To*

	Consumer		Fabric		Drycleaner		Unknown		Total	
	1959	1958	1959	1958	1959	1958	1959	1958	1959	1958
1) Dimensional Change	418	405	601	619	355	354	310	317	1684	1695
2) Fabric Damage	2766	3068	2534	2411	1149	1158	76	28	6525	6665
3) Finish Damage	352	351	759	630	753	621	54	48	1918	1650
4) Dye or Design Damage	1976	1986	3825	3586	791	763	157	104	6749	6395
5) Stains	2965	2929	336	284	1084	1018	140	118	4525	4349
6) Labels not Followed					36	—			36	—
							Garment Construction		483	529
									21,920	21,379

New Problems in 1959

	Number	% of Group
1) Discoloration caused by fluroescent brighteners	292	47.1
2) "Heat stains" on Dacron/wool suitings	150	24.2
3) Cross-dye staining in tweed (Italian import)	33	5.3
4) Matting of acetate quilted housecoats bonded with polyvinyl acetate	30	4.8
5) Delamination of rubber coated, shell fabrics (Hong Kong)	39	6.2
6) New type yarn shift or distort—silk warp satin (imports)	26	4.2
7) Rub or abrade marks on silk organdy finish	22	3.5
8) Tricot yarns snagged	21	3.4
9) Loss of color—polyester-type blend	8	1.3

TOTAL ITEMS IN GROUP — 621

Major items in each group were:

A) *Consumer Service Conditions*	1959 Number	% of Group	1958 Number
1) Cold wave damage to color	1273	15.0	1377
2) Caramelized sugar stains (sugar-protein reaction)	771	9.1	890
3) Fiber damage—mineral acids	760	9.0	703
4) Fiber damage—heat (scorch or melt)	582	6.9	664
5) Fiber damage—insect (wool 340, other 127)	467	5.5	512
6) Oxidized oil stains	446	5.3	374
7) Dye stains on fabric	391	4.6	345
8) Shrinkage	391	4.6	367
9) Finish loss or appearance change	352	4.2	351
10) Chloride damage on silk (tendering)	303	3.6	292
11) Tears and rips	257	3.0	298
12) Yellow streaks in drapery fabrics	253	3.0	286

TOTAL ITEMS IN GROUP — 8,477

B) *Fabric Defect*	1959 Number	% of Group	1958 Number
1) Loss of color—pigment prints	1112	15.0	1118
2) Sun tendered drapes	951	12.8	982
3) Splits in silk warp fabrics	750	10.1	971
4) Sun fade	623	8.4	676
*5) Relaxation shrinkage	574	7.7	572
**6) Color rub off	386	5.2	270
7) Fluroescent brightener	292		
8) Fume fade on acetate	283	3.8	308
9) Dye migration	245	3.3	215
10) Acid-sensitive color	229	3.1	249
11) Flock print loss	205	2.8	169
12) Fiber damage—color caused oxycellulose	187	2.5	
13) Dacron-wool heat stains	150		
14) Fugitive	138	1.9	169
15) Loss of color—lacquer prints	128	1.7	192
16) Metallic print rub off	119	1.6	

TOTAL ITEMS IN GROUP — 7,434

*294 were jersey garments (wool and wool/Orlon) 60% prints 40% plain shade.
**50% turquoise blue cotton, 50% drape prints.

C) *Faulty Drycleaning Practice*	1959 Number	% of Group	1958 Number
1) Tears and rips of unknown cause	913	21.8	986
2) Dye stains from faulty prespotting	457	11.0	445
3) Color loss—spotting and prespotting	375	9.0	370
4) Redeposition (graying)	292	7.0	203
5) Shrinkage (felting)	177	4.3	176
6) Detergent residue stains	174	4.3	171
7) Chafing (spotting caused)	153	3.7	—
8) Stretching Orlon sweaters	143	3.4	105
9) Delustered acetate (steaming while damp)	134	3.2	145
10) Stiffness of plastic fabrics in DC	103	2.5	—
11) Nap or pile distortion	100	2.5	—
12) Color loss—glass fabrics	76	1.8	—

TOTAL ITEMS IN GROUP — 4,168

D) *Unknown*	1959 Number	% of Group	1958 Number
1) Shrinkage	279	38.0	303
2) Misc stains	140	19.0	116
3) Color loss or change	148	20.0	103

TOTAL ITEMS IN GROUP — 737

E) *Garment Construction*		1959 Number	% of Group	1958 Number
1) Button caused damage		161	33.4	143
a) Fiber tendering & discolor-nitrate type	114			
b) Adhesive stain	31			
c) Dye bleed stains	16			
2) Stain—fugitive dye in shoddy interlinings (car coats)		63	13.0	85
3) Neoprene coating—acid damage		40	8.3	36
4) Foam rubber (stains)		38	7.9	41
5) Dress shields (stains)		31	6.4	33
6) Fires (foam rubber shoulder pads)		1	—	—

TOTAL ITEMS IN GROUP — 483

US Rubber, Borden's to Form Jointly Owned Chemical Company

A program for the construction of a 50-million-dollar complex of chemical plants which would convert hydrocarbons into more than a dozen chemical products was revealed last month by The Borden Co and United States Rubber Co.

The two companies announced that they are forming a jointly owned chemical company to be called Monochem, Inc, which would erect a major chemical manufacturing unit using hydrocarbons such as natural gas or low flash point liquid fuel as a starting point for the production of acetylene and vinyl chloride monomer.

Present plans call for both companies to erect adjacent individually owned plants which will use the output of the Monochem plant for the manufacture of other chemical products.

The companies disclosed that they have optioned several industrial sites in Louisiana between Baton Rouge and eastern New Orleans, and in Texas in the Corpus Christi to Houston area. Other locations are under consideration. For some time, site survey teams have been making engineering studies of the properties under option.

The new chemical company, it was said, would be an economical source of basic chemical components for the present product lines of the parent organizations. From a long-range viewpoint, the combined venture will provide a base for independent expansion into new fields by each company.

The Monochem plant, on which construction will start later this year, initially will have the capacity to produce more than 80 million pounds of acetylene and approximately 150 million pounds of vinyl chloride monomer yearly. This would make it one of the largest plants of its type in the country.

Borden and U S Rubber decided to join in the construction of the hydrocarbon-based plant when it was determined that the total of their individual needs for vinyl monomer, other acetylene-based chemicals and byproducts, would make such a plant feasible.

Both parties indicated that important elements in final site selection will be the accessibility of basic chlorine supplies, ample land for long-range expansion and marine loading facilities for shipment of both raw materials and finished products.

It is estimated that the new plant will be completed in 1962. Engineering companies have already been selected for design and construction of these facilities.

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Hilton-Davis Installs Units to Curb Chemical Odor

The Hilton-Davis Chemical Co, Cincinnati, O, has announced the development of processes, and installation of equipment, which control for the first time certain types of chemical odors.

The most recent installation was placed in operation at the plant on April 15, Harold Hansen, general manager, said. "To our knowledge, it is the best of its type," according to Dr Hansen, "and is the only known successful method in the United States of controlling certain amine odors. The installation absorbs odors produced by these amines, chemicals with strong smells difficult to control because they are noticeable even in chemical dilutions of as little as five parts per million."

Dr Hansen also disclosed "very substantial progress at considerable expense, in curbing other chemical odors." For example, he said, "we feel that we now have under control the phenol odors, which have a distinctive smell. In 1959, new rotary type drier equipment was installed in conjunction with a chemical spray absorption tower at a cost of $55,000.

"We recently designed, and are now installing a phenol recovery unit consisting of two 40-foot stainless-steel extraction columns at a cost of about $50,000. This installation is expected to be in operation by July 1. These various units, we believe, will reduce phenolic odors to a point where they should rarely, if ever, be a neighborhood nuisance.

"But it must be remembered that a chemical plant will always have some odor problems. Hilton-Davis has made such progress in eliminating many of these odors through its continuing research program aimed at constant reduction of odor levels.

"The chemical industry has grown by leaps and bounds in the past two decades, and this has brought with it a tremendous number of unsolved problems, one of which is the control of odors in the atmosphere," Dr Hansen said.

The special equipment installed by Hilton-Davis to control odors was one of the attractions of the national convention in Cincinnati of the Air Pollution Control Association, May 23-30. Hilton-Davis was one of the local plants inspected on May 25 by air pollution control officials from all parts of the United States, as well as Federal officials and scientists, industrial pollution control engineers and foreign scientists and officials.

The particular amine odors eliminated by the absorber unit have been an occasional source of smell in the neighborhood of the Hilton-Davis plant. Other amines manufactured at the plant produce odors which are not considered as offensive because of their low unit levels.

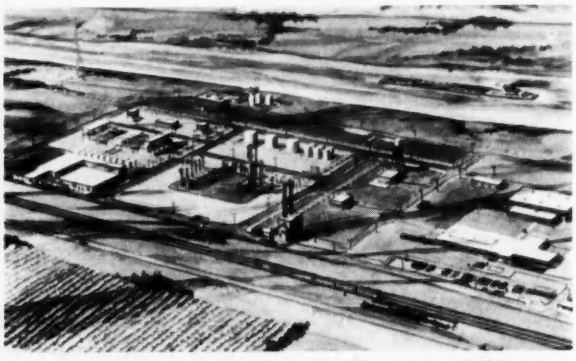
Over a year of research and development by Hilton-Davis engineers went into perfecting the absorber unit. This work was under the supervision of Harold E Borger, the firm's chief engineer, and Robert A Harris, production superintendent. A key role in the development was played by Nathan Gilbert of the Univ of Cincinnati, who has been serving for the past year as a consultant to Hilton-Davis on odor control and other air-pollution matters. As part of its continuing program to handle the problem, Hilton-Davis appointed Donald A Brown in 1958 as full-time engineer in charge of the company's air- and stream-pollution-control work.

Hilton-Davis, which has been operating at its present location at 2235 Langdon Farm Road since the early 1920's, intensified its anti-odor program in 1950. In certain cases where no known method existed to eliminate an air pollution problem, new methods were developed by Hilton-Davis engineers and chemists, and by expert consultants retained by the company.

It inaugurated some time ago a monitoring program to measure odor levels at the source, and correlate odor with odor strength in the neighborhood of its plant. These measurements, supplemented by reports from residents of the area, are regarded as highly useful.

Hilton-Davis' record of major accomplishments in combatting odors dates from 1952. In that year it tackled the staggering problem posed by varnish fumes. Odors produced by cooking the many oils in making varnish are highly objectionable. Several years of research by Hilton-Davis engineers culminated in the installation of the catalytic oxidation method, which was relatively new at the time and had never been applied to varnish-cooking kettles.

Hilton-Davis installed a battery of catalytic fume burners in 1952, the first installation of its kind in the US. The equipment proved to be completely successful, and has since been installed by many varnish plants throughout the country.



Artist's drawing of the Neal, W Va, plant of Novamont Corp, wholly owned American subsidiary of Montecatini Soc Gen, Milan, Italy. The plant, scheduled to go on stream early in 1961, reportedly will produce 25 million pounds per year of Moplen isptactic polypropylene. The Neal plant is Montacatini's first American manufacturing facility and marks the Company's official entry into the U S industrial field of chemicals production.

45th KAE Expected to Attract Representatives from 4500 Companies

The 45th biennial Knitting Arts Exhibition will be held at the Civic Auditorium in Atlantic City, NJ, April 24 to 28, 1961.

The Exhibition is sponsored jointly by three trade groups for the knitting field: the National Association of Hosiery Manufacturers, the Underwear Institute, and the National Knitted Outerwear Association.

Representatives of approximately 4,500 companies in the U S and Canadian knitting industries, as well as those from foreign countries, are expected to attend the five-day Exhibition.

Displays from manufacturers and suppliers here and abroad will fill some 600 booths, the sponsors said.

At the 1959 KAE, executives of companies in the U S and from 35 foreign lands were among the reported 13,000 attending. Their purchasing power was estimated at more than $1,500,000,000.

The Associations stated the knitting industry annually produces close to two billion pairs of hosiery, more than one billion underwear items and ¾ billion outerwear items.

●

GE Again Lowers Silicone Prices

For the second time in 10 months, the General Electric Co has announced a reduction in the price of silicone fluid and emulsion products.

The latest price reduction, amounting to approximately four percent, went into effect June 1st. The previous price cut, which occurred in September, 1959, also amounted to approximately four percent.

New Weekly Publication Reviews Technical Articles Published in Soviet Press

A weekly review of scientific and technical articles appearing in the Soviet press and of significant new Russian books is now being published by the Office of Technical Services, Business and Defense Services Administration, U S Department of Commerce.

Called "Current Review of the Soviet Technical Press" (Order No. 60-21441), the publication is sold on subscription by OTS at $7 for six months ($2 additional for foreign mailing).

The time lapse between appearance of an original article in a Russian publication and its review in the "Current Review of the Soviet Technical Press" is no more than a few weeks and usually within a month, according to OTS.

The reviews cover articles in many fields of science and technology. While articles are not translated in their entirety, each review gives a citation to the original Russian publication, including page numbers.

The reviews are prepared by an agency of the U S Government for its own use and turned over to OTS for publication in the interest of American science and industry. This publication is a new feature of the OTS program of collecting and distributing translations, digests, and abstracts of foreign technical information.

●

Chemical Exposition USA 1960

Plans for Chemical Exposition USA 1960, to be held in New York September 13th to 15th, are nearing completion with 132 of the available 139 booths already taken.

With most booths larger than conventional booth sizes, Chemical Exposition USA 1960 reportedly will be the largest event of its kind held for the industry.

This event will mark the first time an exposition of this type has ever been held concurrenly with a national meeting of the American Chemical Society in New York.

The exposition will be held in the Statler Hilton Hotel in conjunction with the 138th National meeting, which will open on September 11th.

Chemical Exposition USA 1960 is designed primarily to appeal to chemists and chemical engineers. Many of the leading chemical companies will be exhibiting, as well as manufacturers of glassware, instruments and laboratory supplies. The list also includes industrial laboratories, research foundations, book publishers, bulk handling equipment, scales and measuring devices, as well as those in the computing field.

A brochure containing floor plans and other pertinent information is available. Write the Exhibit Office, Hotel Sheraton-Atlantic, New York 1, NY.

●

USDA Contract Awarded TRI

Textile Research Institute recently was awarded a contract with the Agricultural Research Service of the U S Department of Agriculture to conduct research on cotton fiber properties.

Ludwig Rebenfeld, TRI's associate research director, will be in charge of the program. The contract has been awarded to the Institute for a systematc investigation of nonaqueous swelling agents for cellulose to provide new chemical and physical modifications of cotton. The research will be conducted over a two-year period and will be supervised by the Southern Utilization Research and Development Division of the U S Department of Agriculture in New Orleans, La.

●

Polimeros Name Change

The corporate name of Polimeros, SA has been changed to National Starch & Chemical de Mexico, SA de CV.

The change in name has been made to bring together the various international operations under the National corporate name.

The manufacturing plant, which is located in Mexico City, is a major producer of polyvinyl acetate polymers, copolymers and adhesives.

Four New Rodney Hunt Products Shown at Atlantic City

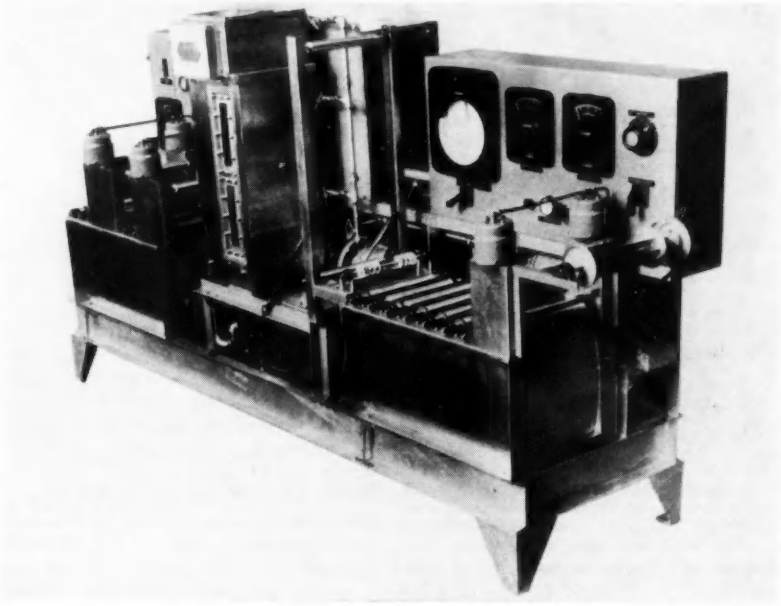
At the recent American Textile Machine Show in Atlantic City, Rodney Hunt Machine Co, Orange, Mass, introduced four new products: a rapid bleach range, a mangle and padder, a wood fiber roll and a bow spreader roll.

Greatest interest was aroused by a working, small-scale model of a new bleaching range engineered and manufactured by Rodney Hunt for the DuPont rapid bleach process. This new process is said to eliminate many of the problems previously associated with open-width bleaching. The range is said to be simple, compact, continuous, and reduces mechanical handling operations. Adaptable to continuous or semicontinuous open-width systems, rapid bleaching is said to be ideal for medium-weight cotton fabric and to be especially suited for hard-to-handle heavyweight fabrics that are susceptible to bruising. A major advantage claimed is that cloth storage time in each J Box may be cut to as little as eight minutes. Production-size versions of this system have been given extensive preliminary tests and are said to have proven highly successful.

Another operating machine that aroused interest was the new Rodney Hunt "95" Wring-Master® mangle and padder, a new machine incorporating a number of design features that are claimed to assure high extraction, ease of operation, and simplicity of maintenance. It is claimed that the newly designed pressure pack is so compact that a 15-ton squeeze can be obtained with a unit only one-half the size of a conventional pressure cylinder for producing the same pressure.

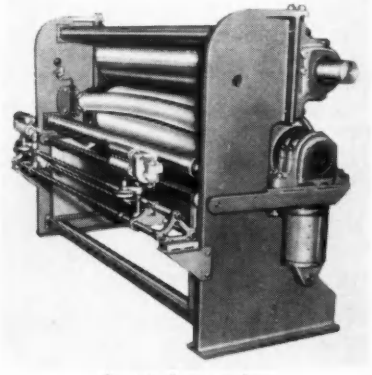
The machine also introduced the application of two new rolls. One of these was a wood-fiber roll manufactured by David Bentley, Ltd, of Manchester, England, for whom Rodney Hunt is the United States agent. These rolls are constructed of pure wood fiber compressed to form a solid block material that is said to be uniform and resilient even under very heavy pressure. The wood fiber roll is said to be much more durable than solid wood and reportedly will run for long periods without requiring turning or other maintenance.

The other roll introduced with the mangle and padder was the new Aquatrol® Expander developed by Rodney Hunt. Reportedly embodying an entirely new principle, the



Rodney Hunt Rapid Bleach Range

"95" Wring-Master mangle and padder



Aquatrol expander

Aquatrol expander is a bow spreader roll with only one moving part, a rotating rubber sleeve that floats on a film of water with practically no friction. The result is said to be a smooth, even spreading action over the face width. Since the water film substitutes for the multiple bearings of the conventional bow roll, bearing maintenance and the possibility of bearing failure are both eliminated, it is stated.

Although introduced as a part of the Wring-Master mangle and padder, both the Bentley wood fiber roll and the Aquatrol expander have other applications throughout the textile industry.

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Celanese Finds Metal-Edge Filters Clean Economically

Automatic, self-cleaning, metal-edge filters are being used by the Belvidere, NJ, plant of Celanese Corporation of America to filter polyvinyl acetate latex.

The motor-driven filters, with stationary stainless-steel cleaning blades, were adapted to rigid Celanese specifications by engineers from Purolator Products, Inc, designers and manufacturers of the filters. Extensive refinements were necessary to meet the special requirements of filtering the polymerized materials.

Two filters, mounted adjacent to storage tanks, are operated alternately to filter "skins", grits and other foreign particles from the polyvinyl acetate latex emulsion. Skins are dried emulsions which form on the reactor sidewall during the polymerization process.

The vinyl acetate and "copolymers" are polymerized by means of a suitable catalyst at atmospheric pressure and at temperatures ranging from 130°F to 180°F. The resulting emulsion comprising 55 percent solids in an aqueous continuous phase is then passed through the filter into a stor-

Richard Witte, production operator at the Belvidere plant of Celanese Corporation of America, removes the housing from a Purolator metal-edge filter used to remove foreign particles from polyvinyl acetate latex emulsion during its transfer to storage tanks.

age tank. Particle size varies with the type of emulsion from 0.1 to 1.5 microns while filtration comparable to an 80 mesh screen is accomplished.

Each filter purifys 50 to 100 gallons of emulsion per minute at about 15 psi pressure drop with a normal inlet pressure of 25 to 30 psi. According to the supervising engineer, Celanese can now run several thousand gallons of emulsion through each filter before cleaning the filters. By operating the filters on alternate cycles, Celanese has ample time to clean each filter during normal down time.

Cleaning the Purolator filters is much simpler and more economical, according to Celanese operating personnel, than the method used to clean filtering apparatus formerly used. Steam is used to clean emulsion from the filter and warm water is then used to remove any remaining residue. Once every ten maintenance periods, a solvent is used to thoroughly clean the entire unit.

A continuous cleaning process takes place within the filter itself as two stationary stainless-steel cleaning blades scrape the outside edge of the motorized filtering element, which rotates at a rate of 7½ rpm, thus cleaning it of any residue from the polyvinyl acetate latex emulsion.

The spiral trapezoidal ribbon has predetermined, spaced integral risers formed in the steel ribbon. The height of the risers accurately space one coil from the other and determine the degree of filtration efficiency. The tightly wound coils in the cylinders form a strong, rigid edge for the filter housing.

The risers, which vary from 7 to 20 per inch depending on the material to be filtered, are tapered to prevent wedging of solids behind the front edges. The desired spacing of the winding is permanently maintained on all points of the filtering surface, thus maintaining uniform filtration over the entire filter surface.

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Radcor Announces Infrared Oven and Equipment Lines

A complete line of infrared heating equipment and infrared ovens for most all types of commercial and industrial applications has been introduced by Radcor, Inc, Bradner, Ohio.

The equipment in the line consists of components, modular oven sections, that can be used singly or constructed in custom form by the customer, and a group of oven units designed and built for basic commercial and industrial operations. These ovens include batch type, vertical, horizontal and portable types.

The equipment is divided into two series: the "L", in which all linear heat sources may be used, and "G", which will accommodate all G-30 lamps spaced on 12-inch centers. Two basic parts are required for a Radcor oven in either series—modular sections and frame wireway or frame.

The modulars are said to be in sturdy steel housing with double backwall construction. In the "L" series, they come in two widths, six inches and 12 inches, and in four lengths. In the "G" series, they are available in a 12-inch width and in three lengths. In both series, the reflectors, which back up the heat sources, are said to be optically designed to produce correct heat distribution. Several types of reflecting materials are available.

The frame-wireway is a heavy gauge channel which serves for the collection of wires from various sections, a housing for terminal blocks, supporting framework for the oven, and can serve as an air chamber for applications where forced air is required to cool terminals and lamp seals. The frame wireway has also been designed to permit contouring to fit various oven requirements.

The oven also comes in a complete range of basic shapes and sizes. They are said to be built to JIC and FIA specifications. They are available with or without ventilation systems or electrical control systems. The heat sources offered consist of metal-sheath heaters, quartz tubes, quartz tungsten lamps or G-30 tungsten lamps.

Radcor, Inc is a subsidiary of Edwin L Wiegand Co, Pittsburgh, Pa, manufacturers of Chromalox electric heating equipment.

For further information, request Bulletin BRG100 from Radcor, Inc.

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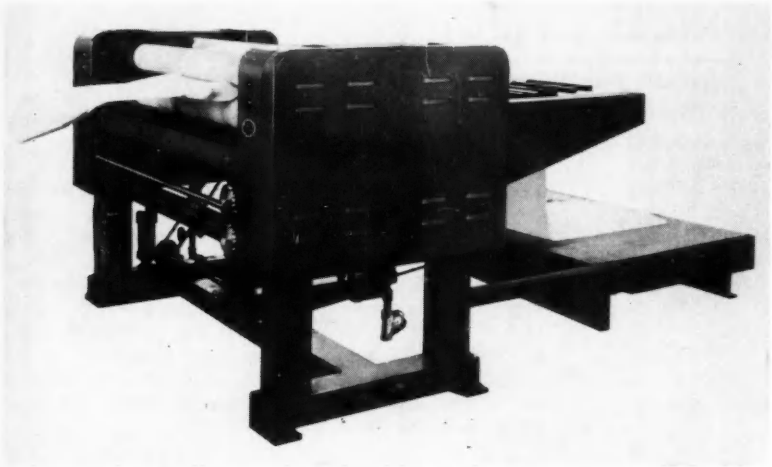
Scotchgard with Bradria

A durable stain- and water-repellent finish that is said to retain its water repellency even after many washings or drycleanings has been announced by the Bradford Dyeing Association, USA, 108 West 39th St, New York, NY. According to Executive Vice President Ernest J Chornyei, this finish combines Scotchgard, a fluorochemical stain repeller developed by Minnesota Mining and Manufacturing Co, and Bradria, a durable water repeller developed in Bradford's Westerly, RI, laboratories. The combined result is said to be an effective new process that provides an excellent protective finish for rainwear, jackets, casual and outerwear.

The combined finish is said to be a direct result of the number of complaints and customer returns that were difficulties encountered by manufacturers in the sales of water-repellent "ready-to-wear". It became evident that instructions were not followed properly by the consumer for maximum water-repellent durability. For example, Dacron-and-cotton rainwear was not rinsed sufficiently to get out all the soap or detergent. This in turn meant that the fabric was subject to rewetting and the problem of washing or drycleaning—particularly with the use of detergents—made the garment less water repellent.

The new Bradford finish therefore became an intensive part of a continuous research and development program maintained by Bradford, and the resultant combination of Scotchgard and Bradria is claimed to be a durable water repellent that allows fabric to "breathe" and that can actually be machine-washed or drycleaned with detergents without materially lessening the water-repellent properties.

In addition to assuring good water-repellent durability for the life of the garment, this new finish is enhanced by the Scotchgard process that repels oil and water-borne stains, it is claimed. According to Mr Chornyei, the Scotchgard-Bradria finish has undergone a large amount of testing, ranging from spray rain tests to durability tests based on before-and-after effects of washings and drycleanings.



Turbo-Beard spreader steamer for tubular knit control

Turbo-Beard Spreader Steamer

Turbo Machine Co, Lansdale, Pa, has announced the development of the Turbo-Beard Spreader Steamer for tubular knit goods, marking the Company's first entry into this field.

The new machine, shown for the first time at the American Textile Machinery Exhibition in Atlantic City, May 23-27, has a patented spreading and feeding mechanism that over-feeds the fabric to the steaming zone for maximum shrinkage. The result, a Company spokesman said, is full elasticity and accurate dimensional control in shirtings, sweaters, and skirt fabrics, as well as in stretch-yarn fabrics for girdles, panties, and swim suits.

By feeding rather than pulling the fabric through the steaming zone, the new machine is said to eliminate bowing, which causes wales. The fabric is in full contact with the feeding mechanism, top and bottom, and side to side, as it moves into the steaming zone. No butterfly spreader is required to correct uneven fabric feed, it is claimed.

An optional electronic device reportedly prevents operator error by automatically shutting off the steam when a section of rubberized fabric is in the steaming zone.

D'stuff 6-27 9 on 10 T GAL 25 L

The Turbo-Beard machine incorporates controls for maximum flexibility in roll-to-roll speed, and drive-to-roll speed. Speed of the folding table reportedly can be varied without the necessity of changing sprockets, and press rolls can be covered with a variety of materials to maintain fabric characteristics or to impart new characteristics to the fabric.

Tubular fabrics up to 54 inches wide can be processed in the machine at speeds up to 25 yards per minute, it is claimed. Single, double, or triple ends can be handled.

The machine, guarded by an enclosure, has a safety device which automatically separates rolls in the event of an emergency.

Turbo offers a choice of a folding mechanism or a wind-up, at the delivery end of the machine. It is stated that the results of accurate tension control can be obsersed in the folding operation, where the fabric folds without bumps, and patterns match closely at every point. Tubular knit goods of natural or synthetic fibers can be processed on the machine.

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Automatic 1000-lb Fiber Setter

A new 1000-lb capacity fiber setter, for processing synthetic fibers in skeins, on bobbins, or as sliver, has been developed by Turbo.

The new machine, with a cylinder or shell six feet in diameter and 10½ feet long, has more than three times the capacity of other Turbo fiber setters. The first machine has been built for Bibb Manufacturing Co, Macon, Ga, and will be used for setting carpet yarn in skeins.

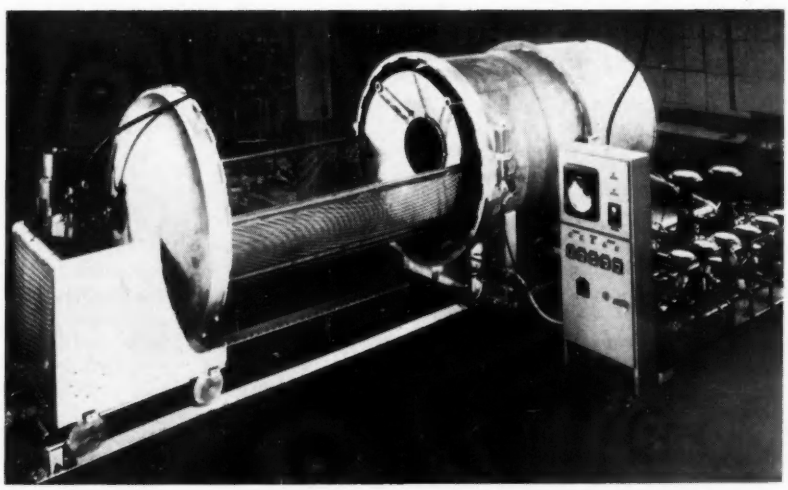
With the new Turbo Model FS-1000, the basket carrier is mounted on the door and moves into the cylinder automatically at the push of a button. During processing, the basket can be rotated or oscillated, thus eliminating the need for a separate bulking operation. There is said to be no need for a separate humidifying operation as the machine maintains the proper amount of moisture in the material being processed.

Pressure or vacuum cycles in any combination reportedly may be used. The machine is said to be capable of 80 psi. Steam is produced in the cylinder by means of a boil-off, eliminating the possibility of superheated steam coming into contact with the fibers being processed.

When processing is completed, the door opens automatically and moves out of the cylinder on the trolley to the unloading position. The basket rotates at the push of a button for unloading fibers on conveyor, truck, or table.

Foxboro recording instruments are used to show pressure, vacuum, and temperature and to assure identical results from lot to lot. The FS-1000 is equipped with two 10-HP Nash Hytor vacuum pumps which are said to be capable of drawing 24 to 26 inches of vacuum.

All valves operate pneumatically. The equipment requires 17 × 26½ feet of floor space.



Turbo Model FS-1000 fiber setter

TECHNICAL LITERATURE

(Literature is available from sources shown in italics)

A LOOK AT THE 1960s—*Werner Textile Consultants, 1430 Broadway, New York 18, NY*—The economic, technological, financial and marketing outlook for the textile industry is the subject of this 40-page booklet.

The brochure contains five papers delivered by nationally known authorities in their respective fields at a seminar for textile executives presented by Werner Textile Consultants on the occasion of the American Textile Machinery Exhibition-International in Atlantic City in May.

Widespread interest in the seminar and industry-wide requests for reprints of the papers prompted the publication of the brochure, according to a spokesman for the consulting organization.

The papers include: "The Economic Outlook for Textiles," by Prof William H Miernyk, director, Bureau of Business and Economic Research, Northeastern Univ; "Vistas of Textile Technology," by Walter Regnery, vice president, Joanna Cotton Mills Co; "Financing Equipment Modernization," by Walter M Kelly, president, Commercial Factors Corp; "A Marketing Man's Outlook on Machine Modernization," by C W Bendigo, director of marketing, Werner Textile Consultants; and "The Textile Merchant Then and Now," by Frank Leslie, vice president, Burlington Industries, Inc.

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ARQUAD 2 HT—*Armour Industrial Chemical Co, 110 N Wacker Dr, Chicago 6, Ill*—This new booklet discusses the use of Armour Industrial Chemical Company's dimethyl distearyl quaternary ammonium chloride as a fabric conditioner.

Tradenamed Arquad 2 HT, the product reportedly has the ability to impart excellent softness and improved handling properties to cellulosic fabrics. In addition, it is said to provide antistatic properties and enhanced wrinkle recovery to synthetic fabrics.

The booklet reviews Arquad's physical and chemical properties, home laundry applications, and industrial textile uses.

Additional advantages of Arquad 2 HT cited by AICC include better appearance of "wash-and-wear" clothing, reduction of electrostatic charges, easier ironing, faster drying and less tendency to mildew.

●

1959 ASTM PROCEEDINGS, VOL 59—*$12.00; American Society for Testing Materials, 1916 Race St, Philadelphia 3, Pa*—This 1424-page volume records the technical accomplishments of the year, including reports and papers, together with discussions, offered to the Society during the year and accepted for the *Proceedings of ASTM*. The volume includes the Summary of Proceedings of the ASTM 62nd Annual Meeting, June 1959, and the Summary of Proceedings of the Third Pacific Area National Meeting, September 1959, listing by title and author the programs for each session.

There are 71 reports of technical committees which, together with appendices, provide much useful information, as do the 44 technical papers and discussions on a wide variety of subjects pertaining to research and standards for materials. An important part of the *Proceedings* are the discussions not previously published, which add immeasurably to the value of the technical papers.

The Annual Report of the board of directors highlights matters administrative, technical, and financial and includes a record of meetings held by Society Districts, information on membership gains, publications, honors and awards, and other matters of interest.

In addition to the papers and reports embodied in the *Proceedings*, there are listed all symposia and other special sessions published separately as special technical publications and all papers published in the *ASTM Bulletin*.

Although the Society's publications program has expanded greatly in recent years with an ever-increasing number of special technical publications, the *Proceedings* remains the repository of factual information and a record of the Society's work. An important adjunct is a subject and author index to all papers published in any form by the Society in 1959.

●

ATLAS G-3573—*Atlas Powder Co, Dept C, Wilmington 99, Del*—Atlas G-3573, a new cationic softener, is described in this product information bulletin.

Atlas G-3573 is described as a 100%-active, light-colored softener having cationic properties. It is said to possess the outstanding characteristic of being readily formulated by the textile chemical compounder as a 25%-active fluid dispersion. This fluid dispersion can be handled easily by the mill, it is claimed, and using conventional methods, it can be applied to cotton, rayon, the synthetics and wool.

●

BULLETIN 6001—*United States Testing Co, Inc, 1415 Park Ave, Hoboken, NJ*—Bulletin 6001 describes U S Testing Co's textile laboratory facilities for analysis, research and development, and inspection of fibers, yarns, fabrics (including woven, nonwoven, and knitted), apparel, and industrial fabrics.

The technological facilities of the Textile Division include five major laboratories: physical testing, chemistry and dye evaluation, "wash-and-wear" evaluation, microscopy, and hosiery analysis.

Among the services offered by the physical testing laboratory are tests for abrasion resistance, aging, air permeability, construction, fire resistance, etc. Those offered by the textile chemistry and dye laboratory include defect analysis, fiber composition, colorfastness to crocking, light, atmospheric gases, etc. Tests and measurements of the hosiery laboratory,"wash-and-wear" laboratory, and microscopy and photography laboratories are among others described.

●

BUVOHA TRADE LETTER 1960—*The Commercial Intelligence Office (Buvoha), Oudebrugsteeg 16, Amsterdam-C, Netherlands*—This annual publication contains a great number of addresses of industrial and commercial firms in the Netherlands interested in trade relations with firms abroad. United States firms interested in business relations with Dutch firms may apply to Buhova (Bureau Voor Handelsinlichtingen) for a free copy.

The names, addresses, and product lines of more than fifty textile manufacturers and exporters in the Netherlands are listed in Section I. Also listed in Section I are listings for nine dyestuff and color manufacturers and exporters; 12 textile chemical manufacturers and exporters; and four textile machinery manufacturers and exporters.

Section II, which lists the names and addresses of importers, commission-agents, manufacturers (as buyers and users), with enumeration of the products, raw

REPRINTS

from AMERICAN DYESTUFF REPORTER

The following technical articles—reprinted from recent issues of American Dyestuff Reporter—are available in limited quantity, at prices shown. Send check, money order, or stamps to address below:

Title	*Price*
A COMPARISON OF FABRIC TEAR TESTS	15¢
ACRYLICS IN TEXTILE BINDING APPLICATIONS	25¢
CONTINUOUS DEVELOPMENT OF DIRECT, DEVELOPED DYEINGS	15¢
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A Demonstration of Uneven Deposition of Fungicide on Cellulosic Materials as a Major Variable in Deterioration Evaluation	25¢
SOME FACTORS INVOLVED IN "WASH-AND-WEAR" WOOL	25¢
TEXTILE CHEMICALS—MARKETS & TECHNOLOGY	25¢
THE ARRHENIUS EQUATION IN ACCELERATED AGING STUDIES	15¢
THE DETERMINATION OF THE SOLUBILITY OF DYES	15¢

Write: REPRINTS, American Dyestuff Reporter
44 East 23rd Street, New York 10, N Y

An important technical bulletin has been prepared on this subject, based on actual plant operations developed over a period of many years. It describes basic methods and procedures in detail and shows how significant advantages are now being realized in the preparation of oil-in-water and water-in-oil emulsions through the use of Morehouse Mills and Cowles Dissolvers.

In both types of operations these advantages include—Faster processing of larger batches with thorough distribution of components • Greater volume-per-hour than other equipment • Full control of quality and tints • Important savings in space, operating and maintenance costs • Greater versatility—ability to handle practically any type of material in practically any viscosity range—Dry Pigments, Pulp Colors, Soluble Resins, Dispersable Pastes and Emulsions • Ease of cleaning—rapid change-over without contamination.

Specific advantages in "water-in-oil" method—Rapid grinding of color pigments in resin solutions • Ability to handle all types of such bases • Fast, efficient dispersion of "cut clear" materials • Perfect dispersion in large batches.

Specific advantages in "oil-in-water" method—Complete in-plant preparation of printing color pastes from both dry pigments and color pulps • Perfectly level cuts with thickeners fully dissolved in minimum time • Brighter colors, reproduced to established standards from batch to batch, from month to month.

We are sure this bulletin will be interesting and helpful. Copy will be sent free upon request on your company letterhead for Bulletin 32-1960.

MOREHOUSE MILLS
COWLES DISSOLVERS
610

MOREHOUSE-COWLES, INC.
1150 San Fernando Road, Los Angeles 65, California
REPRESENTATIVES IN PRINCIPAL CITIES
CONVENIENT LEASE AND TIME-PAYMENT PLANS

materials, semimanufactured articles, etc, includes nine listings in the "textiles" category.

Two textile firms are listed in Section III, miscellaneous addresses in the Netherlands.

●

CHEMICAL STATISTICS HANDBOOK, FIFTH EDITION—*$3.00; Manufacturing Chemists' Assoc, 1825 Connecticut Ave, NW, Washington 9, DC*—The fifth edition is a 521-page reference book of the chemicals and allied product industry for the years 1954-8.

The publication is a continuation of the series begun in 1940 to fill the need for a single volume which would include all available chemical industry statistics from official sources.

The fifth edition retains the format of past issues and presents, in tabulated form, production and sales figures of thousands of chemical commodities. Sections cover basic inorganics, tars, synthetic organics, coal-tar dyes, synthetic resins, synthetic rubber, industrial alcohol, fats and oils, naval stores, agricultural chemicals, metals, minerals and miscellaneous items.

Other sections cover employment and wages, wholesale prices, import-export figures and corporate data. A section is devoted also to Canadian chemical and mineral statistics.

As with previous editions, the MCA plans to publish annual supplements to the new handbook beginning early next year, the first of which will contain 1959-60 statistics on selected items, including final chemical data from the 1958 Census of Manufactures.

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COLOR . . . THE KEY TO MORE PROFIT IN SHEETS AND PILLOW CASES—*The Vat Dye Institute, 350 Fifth Ave, New York 1,* NY—The Vat Dye Institute presents in this booklet the findings of a survey whos purpose was to see what can be done to persuade the consumer to buy more sheets and pillow cases and to buy them in color rather than in plain white.

Subject matter of the booklet includes a capsule summary of survey highlights, detailed findings a four-point program for mills and stores, color preferences, other subjects covered the survey, and a technical appendix.

●

CRESLAN ACRYLIC FIBER— *American Cyanamid Co Fibers Div, 111 West 40th St, New York 18, NY*—This technical data bulletin describes the physical properties and performance qualities of Creslan acrylic fiber. It supplements the Company's technical information bulletins on Creslan and the processing of Creslan.

Included in the new data bulletin are a run-down of basic properties, a stress-strain chart, and descriptions of the texture characteristics, processability, dyeability and washability of Creslan.

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CUSTOM WORK, SERVICE ENGINEERING, INSTRUMENTS & EQUIPMENT FOR RESEARCH, CONTROL & PRODUCTION—*Custom Scientific Instruments Inc, Kearny, NJ*—CSI catalog No. 60 contains illustrations and brief descriptions of seventy-seven (77) testers or equipment manufactured as standard products. These units are grouped under the following headings in the index: Abrasion Testers; Biological & Scientific Equipment; Flammability—Ignition Tester; Production, Control and Research Equipment; Thermal Conductivity Dielectric Units; and Thickness Compression and Recovery Gages.

One feature stressed in this catalog is the ability o CSI to custom build testers or equipment of all types for individual and general need. CSI will work to ideas, sketches or blueprints.

●

DYEING SYNTHETIC FIBERS—*Dyestuff and Chemical Div, General Aniline & Film Corp, 435 Hudson St, New York 14, NY*—Booklet GS-66 Rev, an 86-page brochure, contains material relating to the most important man-made textile fibers now commercially available, including several recently introduced brands, as well as data on significant blends of natural and synthetic fibers. Each different fiber is discussed in a separate chapter, giving brand name, chemical type, physical and chemical properties, and end uses.

Each fiber brand, as well as its blends in common use, is described in terms of dyeability, fabric properties, and colorfastness that may be expected. Listings are given of the most suitable dyes produced by GAF's Dyestuff and Chemical Division for use in each instance. The dyes are described by class, end-use suitability and GAF trade name.

Each chapter in the brochure goes into considerable detail on the types of dyes (such as disperse, cationic, acid, azoic, etc) used on the fiber, and discusses working techniques for practical dyehouse application.

Reference lists at the end of the booklet give trade names of fibers and chemicals referred to and identify them with their manufacturers.

Due to the frequent development of new textile fibers, this booklet is now issued in its sixth revision and is said to be especially useful to the dyer as a guide in processing modern fabrics.

●

ERNEST F FULLUM, INC BROCHURE—*Ernest F Fullam, Inc, PO Box 444, Schenectady 1, NY*—Ernest F Fullam, Inc, which consults in industrial development, control, and research, has introduced its new 16-page, illustrated brochure.

The brochure discusses a few of the services offered by the firm and the facilities for rendering them. Sections are devoted to discussion of electron, x-ray and light microscopy; diffraction; x-ray spectrography; microprobe; and instrument and phototype machine development.

●

FANTEX O & W—*W F Fancourt Co, 516 S Delaware Ave, Philadelphia, Pa*—Descriptive application information about Fancourt's clear viscous-type scour is now available.

Fantex O & W is designed to remove heavy, oily or waxy soil. It is said to be effective on most fibers and fabrics, including cotton and wool.

It is stated that, because of its low foaming properties, Fantex O & W is desirable on package machines, jigs and Burlington units where foaming is a problem. Its excellent rinsability, speed and lack of odor carryover are other desirable features cited by the Fancourt literature.

Fantex O & W has an initial pH of 9.5 and is an amphoteric type of detergent that reportedly has a high degree of peptizing properties in an alkaline medium such as caustic soda.

For wool, the pH reportedly has been adjusted to give maximum scouring without degradation of fiber, and no additives, such as modified soda ash, are required.

Fantex O & W is claimed to be an excellent washing agent for wool sweaters, particularly when such garments are made from garnetted stock and there is a high percentage of grease.

FIBER PRIMER—*Fibers Div, American Cyanamid Co, 11 West 40th St, New York 18, NY*—This booklet is designed to answer many of the questions raised by the expanding nomenclature of textile fibers.

The publication lists the official generic terms used in identifying natural and man-made fibers under the Textile Fiber Products Indentification Act of 1960 and the Wool Products Labeling Act of 1939.

The brochure lists the principal fiber trademarks in each generic class, defines the basic performance properties of each class and describes the most important applications for each fiber group in apparel, home furnishings and industrial products.

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FMC CHEMICALS—*Food Machinery and Chemical Corp Chemical Divisions Advertising & Publicity Dept, 161 East 42nd St, New York 17, NY*—This 36-page, two-color brochure lists FMC chemicals alphabetically, with physical data and uses. A supplementary listing highlights the major use areas of FMC chemicals, eg, bleaching agents, intermediates, textiles and synthetic fibers, soap and synthetic detergents, etc.

FMC's chemical divisions are Becco, Chemicals & Plastics, Chlor Alkali, Mineral Products and Niagara.

●

GENACRYL RED 4B—*General Dyestuff Co, 435 Hudson St, New York 14, NY*—Folder No. G-810 is devoted to this new cationic dyestuff, described as a bright, bluish red, recommended by GDC primarily for the dyeing of economical, deep shades of jockey red, scarlet and cardinal on Orlon, Acrilan, Acrilan 16 and other acrylic and modacrylic fibers.

The outstanding properties of Genacryl Red 4B are said to be color value, excellent build-up and stability over a pH range of 4.0-8.5, and very good fastness to washing, perspiration, drycleaning and crocking. Its lightfastness is reported to be adequate for wearing apparel fabrics of the knitgoods trades and its strength, brightness and dyeing economy will make it particularly suitable for the sweater and jersey trades, it is claimed.

The folder describes the characteristics, working properties and uses of Genacryl Red 4B, as well as techniques of application. It also contains colored swatches with various dye concentrations used to achieve different shades, and also gives fiber stain ratios and other performance data as applied to a number of the textile fibers available today.

●

HTR BULLETINS—*Hatch Textile Research, Inc, 25 East 26th St, New York 10, NY*—Five new bulletins, in addition to those mentioned previous (cf page 97 of April 18 issue) are now available from HTR: "Advertising—Use of Hatch Reports or Seal", "Private Brands", "Water-repellency Tests", "Fade-Ometer Tess", and "Tensile Strength Tests". HTR also issued a new price list, effective April 1, showing the increased scope of textile tests it is conducting.

●

IMPORTS OF COAL-TAR PRODUCTS 1959—*Secretary, U S Tariff Commission, Washington 25, DC*—This report by the U S Tariff Commission, issued July 1, covers U S imports of coal-tar products entered in 1959 under paragraphs 27 and 28 of the Tariff Act of 1930. The report provides detailed statistics on coal-tar intermediates entered under paragraph 27, and on coal-tar dyes and other coal-tar products entered under paragraph 28. The data in the report were obtained by analyzing invoices covering general imports of coal-tar products into the United States during 1959.

The report shows that general imports of coal-tar chemicals entered under paragraph 27 in 1959 totaled 28.8 million pounds, with a foreign invoice value of $14.0 million, compared with imports of 14.4 million, pounds, valued at $10.7 million, in 1958. Most of the coal-tar chemicals imported in 1959 were declared to be competitive (duty based on "American selling price"). Almost half of the total imports of these products in 1959 came from West Germany; imports from that country amounted to 10.8 million pounds, compared with 6.9 million pounds in 1958. Imports from Italy in 1959 amounted to 5.1 million pounds, compared with 1.7 million pounds in 1958. Imports from France totaled 2.7 million pounds in 1959, compared with 567,000 pounds in 1958, and imports from the United Kingdom amounted to 2.4 million pounds in 1959, compared with 1.2 million pounds in 1958. In 1959 sizable quantities of products that are dutiable under paragraph 27 also were imported from Canada (1,377,000 pounds), the Netherlands (1,375,000 pounds), Belgium (1,350,000 pounds), Switzerland (1,227,000 pounds), Japan (782,000 pounds), Denmark (764,000 pounds), Spain (364,000 pounds), Sweden (199,000 pounds), the Union of South Africa (165,000 pounds), and Norway (123,000 pounds). Smaller quantities came from Austria (66,000 pounds), and Australia (14,000 pounds).

Imports in 1959 of all finished coal-tar products that are dutiable under paragraph 28 comprised 1,968 items, with a total weight of 11.3 million pounds and a foreign invoice value of $21.9 million. In 1958 imports consisted of 1,636 items, with a total weight of 7.1 million pounds and a foreign invoice value of $15.8 million. In 1959, as in 1957 and 1958, medicinals and pharmaceuticals were the most important group of finished coal-tar products imported.

Imports of coal-tar dyes, the next most important group of products entered under paragraph 28 in 1959, were 22 percent larger in that year than in 1958 and 47 percent larger than in 1957. In 1959 imports of dyes (excluding synthetic organic pigments) were valued at $7.9 million (foreign invoice value), or 36 percent of total imports under paragraph 28. In 1958 imports of dyes (excluding synthetic organic pigments) were valued at $6.5 million, or 41 percent of total imports under paragraph 28. In 1959 imports of synthetic organic pigments (toners and lakes) were valued at $401,000, compared with $286,000 in 1958. 1959 imports of other coal-tar products entered under paragraph 28 (chiefly synthetic resins) were valued at $2.1 million in 1959, or 69 percent greater than in 1958.

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IMPROVEMENT OF WATER-RESISTANT COTTON FABRICS (ARS 72-9)—*Southern Utilization Research and Development Div, USDA, PO Box 19687, New Orleans 19, La*—This comprehensive report on research to improve the water resistance of cotton fabrics is the result of work done at SURDD at New Orleans. Authors of the five papers which comprise the 62-page report include Charles F Goldthwait, William G Sloan, Alton L Murphy, and Edmund M Buras Jr.

Interest in the production of water-resistant fabrics made from American cotton was stimulated by the emergency conditions existing during World War II. One of the first products of research along these lines was the unlined cotton firehose. Such fabrics have a number of uses, such as tents, wearing apparel, tarpaulins, and water containers.

The publication comprises five papers, covering a

wide range of subjects pertaining to water-resistant fabrics, as well as considerable information of general interest particularly on cotton fabric construction and finishing, and the relationship of fiber and fabric properties.

Several avenues of approach to the production of improved water-resistant fabrics were investigated. They include: utilization of the greater swelling capacity of immature cotton fibers, treatment of the yarns before weaving, weaving unusually dense fabrics, and studying the effect of each successive step in fabric finishing on air and water resistance. A large number of experimental fabrics were woven and finished.

Among the many topics discussed are the swelling capacities of various types of cotton fibers, the effects of yarn and fabric structure, and of finishing and of various kinds of treatment, such as mercerization. Conventional tests for water resistance, and special methods utilized during the studies, such as the orifice and centrifuge tests, receive attention. Air permeability, and the effects of entrapped air on the water resistance of the fabric are taken up, as are a number of other subjects, such as capillary systems. Practical implications of the various findings are given. The papers are augmented by numerous statistical tables, graphs, and photomicrographs. The authors have included a list of 37 references to basic literature on water resistance of fabrics.

●

INTRODUCTION OF THE TEX SYSTEM FOR DESIGNATION OF YARN NUMBER—*American Society for Testing Materials, 1916 Race St, Philadelphia 3, Pa*—This memorandum proposes the adoption of the first stage of a program for the introduction of the tex yarn numbering system by the textile industry of the United States. The proposal suggests, as a first stage, including rounded equivalent tex numbers in parentheses after the traditional numbers wherever they are written or printed.

The tex system for yarn numbering has been approved by the International Organization for Standardization, whose membership is world-wide, and plans for its introduction have been formulated by a special committee headed by Holland. The plans provide that, after an initial educational period in which the textile industry becomes familiar with the tex system, the industry shall proceed to the second stage and start numbering and marketing yarns, in tex units.

Similar proposals are being made in many other countries suggesting the adoption of the first stage of the program on tex yarn numbering by industry in 1960.

In this country, the plan is sponsored by ASTM Committee D-13 on Textiles, ASA Sectional Committee L-23 for ISO/TC38 on Textiles.

This current memorandum discusses the plan, the three stages of action to be taken, action to be taken now, and the scope and benefits of the tex system. Five pages of conversion tables and 17 references to the literature are included.

●

LTI GRADUATE THESES—*Office of Special Services, Lowell Technological Institute, Lowell, Mass*—Graduate theses in the fields of textile chemistry, electronic engineering, leather engineering, paper engineering chemistry, and textile engineering, submitted in the academic year 1958-59, are described in the quarterly bulletin, series 63, No. 3, recently released by Lowell Technological Institute. The abstracts were in partial fulfillment of requirements for the M S degree in the LTI Graduate School.

MODERN CHEMICAL SPECIALTIES—*Client Relations Dept, Foster D Snell, Inc, 29 West 15th St, New York 11, NY*—This booklet attempts to outline the scope of the specialties field, and offers a number of brief "case histories" of successful Snell developments in the chemical specialties field.

●

NOPCOSULF SERIES, SULFATED OILS FOR INDUSTRIAL USE—*Advertising Dept, Nopco Chemical Co, 60 Park Place, Newark, NJ*—The Nopcosulf series, described in this new booklet (GEN-4), are true oils but are dispersible in water. They are partially soluble in many hydrocarbons and reportedly find extensive use as emulsifiers for insoluble organic compounds. The products of the Nopcosulf Series represent a group of vegetable, animal and fish oils which are chemically combined with various percentages of the sulfate radical.

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NORCROSS VISCOMETERS FOR SIZING APPLICATIONS—*Norcross Corp, 247 Newtonville Ave, Newton 58, Mass*—Illustrated Bulletin No. V-1213 discusses the importance of viscosity, benefits from the viscometer, typical viscosity-size pickup relationship, principle of operation, and features.

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PVP FORMULARY—*Antara Chemicals, 435 Hudson St, New York 14, NY*—22-page Booklet No. AP-98 is a guide to new and improved products incorporating polyvinylpyrrolidone.

Formulations are given for more than 30 specific products in five major groups. Aerosol, aqueous, and organic-solvent systems are described. Considerable details are supplied for industrial products, including required ingredients and suggested techniques of manufacture.

The characteristics of PVP, as applied to each end-use, are noted in a preface to each of the five groups, which utilize this acetylene-derived chemical's versatile properties.

The booklet suggests new applications for industrial grades of PVP, and it is arranged in such a way that it will serve as a convenient reference and guide.

The booklet opens with a brief general discussion of the advantages of PVP not only as an additive but as an integral part of many different types of products, including soaps and detergents, adhesives, and coatings. New and interesting applications for PVP are constantly being developed, and this booklet should stimulate further activities as well as assist in current production.

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SHEAR-FLOW MIXER LITERATURE—*Normand Smith, sales manager, Gabb Special Products, Inc, Windsor Locks, Conn*—A new brochure covers GSP's complete line of Shear-Flow industrial mixers.

Included in the literature is an explanation of the mixer's design and operation principle, mixer sizes, weights and horsepower available.

Featured is the introduction of the new Shear-Flow continuous mixer, describing its principle, function and available sizes.

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SODIUM ALUMINATES—*Advertising Dept, Nalco Chemical Co, 6216 West 66th Place, Chicago 38, Ill*—Industrial uses of sodium aluminate, which rose to prominence as a water-treatment chemical, are described in Bulletin K 4, a two-color, 12-page brochure.

The brochure also describes sodium aluminate's physical and chemical characteristics.

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